What is Social Network Analysis and How Do We Use It

Partnership & Community Collaboration Academy
Managing by Network

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Americans of all ages, all conditions, and all dispositions, constantly form associations...if they never acquired the habit of forming associations in ordinary life, civilization itself would be endangered.

~Alexis De Tocqueville, 1835
OVERVIEW

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WHY ARE PROFESSIONAL SOCIAL NETWORKS IMPORTANT?

Where Work Happens
- Knowledge
- Performance

Where People Engage
- Satisfaction
- Retention

But . . .
- Invisible
- Tough to Know

Where Knowledge Lives
- Useful
- Fast
COMPARE FORMAL & INFORMAL NETWORK STRUCTURES

Formal Structure

Informal Structure (SNA)
RECOGNIZING WHAT EACH NETWORK STRUCTURE DOES BEST

<table>
<thead>
<tr>
<th>Characteristics of “The Formal”</th>
<th>Characteristics of “The Informal”</th>
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<tr>
<td>Rational</td>
<td>Emotional</td>
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<tr>
<td>Hierarchical</td>
<td>Collaborative</td>
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<td>Disciplined</td>
<td>Spontaneous</td>
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<td>Clarity</td>
<td>Ambiguity</td>
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<td>Aligning</td>
<td>Motivating</td>
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<td>Predictable</td>
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<td>Scalable</td>
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<td>Efficient</td>
<td>Adaptive</td>
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SOCIAL NETWORKS PLAY A KEY ROLE IN ORGANIZATIONAL EXCELLENCE

Where Innovation Lives…
> Rely on people FAR more than databases for information
> Innovation lives in re-combining expertise and ties bridging organizational lines

Where Work Happens…
> After decades of restructurings, work and coordination of work occurs in networks
> Appropriate connectivity drives performance

Invisible Source of Inefficiency…
> Costs of collaboration increasing but not systematically managed
> Invisible decision-making delays consume time and resources

But These Networks Are…
> Invisible and highly misunderstood
> At odds with formal structure, process views of work and standard culture inventories

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SOCIAL NETWORK MAPPING

- A social network is essentially a map of all the relevant relationships between the network members being studied.

- Key to social network theory is the relationship between individuals in terms of nodes and ties (nodes are individuals, ties are the relationships between them).
Social Network Analysis: Five Key Indicators

Relationships are ‘uncovered’ through questions we ask. Network Structure Analysis is based on five key indicators:

1. Direction of information flow
2. Individuals who are overly central
3. Individuals who are loosely connected and may be under-utilized
4. Off-track subgroups
5. Network level of overall connection
SOCIAL NETWORK ANALYSIS THREE KEY CHARACTERISTICS

Network Structure focuses on three key characteristics:

1. Information / knowledge transfer
2. Task flow
3. Trust or energy
EXPANDING NETWORKS

From...

- Implicit philosophy that more collaboration is “better”
- “Shotgun” approach promoting collaboration everywhere
- No focus on relationships that underlie effective collaboration

To...

- Explicit analysis to determine exactly where collaboration is/is not needed
- Targeted approach to address specific barriers to collaboration
- Ability to visualize and correct key relationships (e.g., awareness, trust and even fear)
SOCIAL NETWORK ANALYSIS STUDIES

SCIENCE, RESEARCH & MONITORING PROGRAM, NATIONAL LANDSCAPE CONSERVATION SYSTEM, BUREAU OF LAND MANAGEMENT, 2012

WILD AND SCENIC RIVERS PROGRAM, NATIONAL LANDSCAPE CONSERVATION SYSTEM, BUREAU OF LAND MANAGEMENT, 2012

CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE, BUREAU OF LAND MANAGEMENT AND NATIONAL PARK SERVICE, 2010
This analysis is based on two questions. The first question: Provided survey participants with a list of 102 federal employees with position responsibilities related to the Program and 39 individuals outside of BLM that cooperate and/or partner with BLM staff. We asked each federal employee, “Who do you contact for information, advice and or resources associated with your responsibilities in managing the Program?”

0 = I never, or rarely, go to this person
1 = I sometimes go to this person
2 = I frequently go to this person

102 BLM employees were invited to participate, 61 BLM employees completed the survey for a 60 percent response rate

102 BLM Individuals + 39 individuals outside BLM = 141 Nodes

One Relationship = One Tie

Data collection began January 15 and concluded April 15, 2011.
HOW CAN WE VISUALIZE THE RESULTS OF THE SURVEY?

The analytic software used for Social Network Analysis measures the connections between individuals in the study group.

The associated mapping software provides a visual display of this information using geometric shapes to denote individuals and lines to illustrate network connections.

The analytic software also calculates the number of ties individuals in the network have to each other. This is measurement is referred to as geographic distance.
The analytic software maps survey responses to illustrate the spatial connection among participants in the network. i.e. based on responses all network participants have a fixed place in the map.

The software also “fills in the blanks” if a network participant did not respond to the survey, placement on the map is determined by those who did respond.
Examine the connections among the WO participants
MAPPING OF WASHINGTON OFFICE & PACIFIC RIM: ALASKA, OREGON & CALIFORNIA

Examine the connections among the Pacific Rim participants and their connection to the WO survey participants.
MAPPING OF WASHINGTON OFFICE & PACIFIC RIM: ARIZONA & NEW MEXICO

Examine the connections among the Southwest participants and their connection to the WO survey participants
What is the average distance among reachable pairs?

> The average number of steps it takes to reach all network participants
> The average distance between any two pairs for this network is 2.200

> Scores of 2-3 are generally good, scores of 5-6 indicate a very unconnected network

> Lower scores reflect a group better able to leverage knowledge: shorter distances mean faster, more certain, more accurate sharing

> Access to information, resources and advice for members of this network is within three contacts
WHO CONTROLS THE FLOW OF INFORMATION?

Central Connectors in the network are identified by the highest number of ties. Brokers in the network are identified by their connection to bridge information among groups in the network.

This analysis uses Freeman’s Degree of Centrality calculations to identify Central Connectors and measurements of structural holes to identify Brokers.
BROKERS AND CENTRAL CONNECTORS

High-leverage employees who connect people across boundaries; such as functions, skills, geography, hierarchy, ethnicity, and gender

Central Connectors:
leaders, experts, old timers, gateway roles or political players

Brokers:
Leverage ability to drive change, diffusion or innovate. These people can also be key liaison or cross-process roles
CENTRAL CONNECTORS
Those individuals with the highest number of direct connections

**Overloaded Leaders, Experts or Gateway Roles**
I am working to my limits but still can’t respond to everyone.

**Solution:** Re-allocate information, decision rights and portions of role

**Rising Stars/Flight Risks**
I am rising through the organization rapidly and am being considered for new opportunities.

**Solution:** Recognize expertise, succession planning

**Knowledge Keepers**
I control the information tightly; my position is secure.

**Solution:** Build connectivity to break stranglehold
CENTRAL CONNECTORS

- What happens to the network communication if one-half of the connectors are removed?

Removing the Central Connectors and their links in the network illustrates the role of connectors to foster communication throughout the program.

- What happens to the network if all central connectors are removed?
Degree Centrality:

- Displays how well each individual is connected
- Technical definition: The number of ties a person has
- Study participants have a range of 0-100 links per individual. Results illustrate that 85 or 86 percent of federal employee network participants are well connected to the network. The remaining 15 or 14 percent of 15 federal employees reflect a more limited interaction with the network with 5 federal employees or 3 percent of the network working on the periphery.
- This Program Network Analysis mean degree of centrality score of 11. Reflecting a dispersed communication network driven by inclusion of external individuals/organizations.
SNA RESULTS: WHAT ARE WE LOOKING FOR?

Central Connectors

Sub-Group Connectivity

Peripheral Players

Brokers/Boundary Spanners

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INDIVIDUALS ON THE PERIPHERAL
Those who work on the edge of the network

**Niche Experts/Balance**
I research very specific technologies and feed my findings to a research group.
**Solution:** Room to maintain a productive peripheral position; a dual career path

**Disconnected Contributor**
I’m new to this organization. Few people know me or my capabilities, but I don’t know where to turn for help.
**Solution:** Orientation, staffing, mentoring, training

**Loners**
I prefer to work alone. I often feel out-of-step with my co-workers.
**Solution:** Support improve communication and collaboration
SECOND SURVEY QUESTION EXAMPLE

“On a scale of 1-5, please rate your preferred way of communicating (5 = favorite, 0 = least favorite)

- Face to face
- Telephone
- Email
- Text Messaging
- Formal Meeting
- Chance Meeting
- Conference Participation
Communication Preferences

Federal survey participants place the highest values on direct communication of face to face meetings.

Phone calls, email and conference participation are of equal preference to participants.

Formal meetings are preferred to chance meetings.

Text messaging is limited means of communication.
SUMMING IT UP…

- Network analysis is a valuable tool for helping units to understand what their informal network looks like and how it has evolved.

- Once leaders and network participants decide to evaluate their networks, the conclusions drawn must then be translated into actionable results.
CREATING ACTIONABLE RESULTS

- Cultivate social networks: because networks impact individual and group success
- Network visioning: how does this network link to external networks
- Develop tangible goals related to network activities
- Action planning
- Factor network-building into objectives and employee development plans

Network data

Roles, process, objectives

Am I “well connected for the task?”
FOCUS ON TWO LEVELS: INDIVIDUAL AND GROUP

“Our network” is as important as “My network”

**Individual**
Assert behaviors and take individual action

- Volunteer for cross-functional teams
- Use more face-to-face communication
- Treat network-building as integral part of my work
- Leverage people in existing network to establish new contacts
- Attend conferences
- When interacting, ask questions to find commonalities

**Group**
Provide collective action, mindset and resources

- Network “mentoring”
- Ensure “Acting Responsibilities” support network communication
- Rewards that promote trust & collaboration
- Create a unique and conducive physical environment
- Use preferred methods of communication
- Joint training with colleagues
DISCUSSION

1. How will you use your knowledge of the social network to address the absence of federal staff related to details, fire duty, training, succession planning?

2. How will you use your knowledge of the social network to support collaboration between external organizations and federal employees with similar Program responsibilities?