

## MAPPING AND EXPLORING INFORMAL NETWORK IN ORGANIZATIONAL AND COMMUNITY LEADERSHIP

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**Abstract:** Work often happens through informal interactions and relationships. Formal networks and vertical channels no longer enough for the organizational and community capacity to adapt to the rapid social changes and disruptions. Just as the network knowledge is an asset for any organization in the disruptive era, understanding people's connections and network's approach is critically important in the cultural transformation of the leadership in the community and organization. The purpose of this article is to review and investigate how Social Network Analysis (SNA) could visualize and analyze the informal networks in organizational and community leadership's studies. This study introduces a model that combines organizational leadership and community leadership as a social relations category in a micro-sociological perspective. By applying social network approach to evaluating leadership network, the organization or community can more efficiently scale and accelerate their development as well as solves their leadership problems. This method is useful for those who are seeking to influence policy, disseminate new ideas, and mobilize resources towards a common or a specific goal. SNA provides a set of theories, tools, and processes for understanding the relationships and structures of a network. SNA will determine the particular measures, from simple to complex rules, which need to be applied to derive insights from the network and how the network system is structured and evolved with time. The results of this review could help leaders to diagnose, measure, and evaluate their informal network structures and dynamics which are connected through shared interests, work, experiences, and collaborations.

**Keywords:** Community development; community leadership; informal network; leadership network; social network analysis

### 1. Introduction

To tackle the problems and dynamic changes in the 21st Century, leaders need to change the old-fashioned organizational models and simplistic conceptions of leadership (Hill & Martin, 2014). They need more effective and efficient ways to connect, share, support, learn and mobilize resources in a strategic direction with one another. Traditional leadership theories have concerned on vertical leadership, in which focused on a person who tries to determine groups or followers to achieve convinced objectives by their position or authority (Hassan & Silong, 2008). Nonetheless, the leader is not the only one who can demonstrate leadership behavior, but the team members can also exert influence on each other and share the leadership process (distributed leadership) (Small, 2007). Informal power and access to influential people

were other key benefits of networking sighted by the leaders. One of the challenges for the field of leadership development is how to evaluate leadership networks, particularly in the informal circumstances.

Why developing informal network perspective is vital in the 21st-century leaderships? According to the Center for Creative Leadership (2014), there are seven reasons why network perspectives are significant. *First*, connections matter. The relationship among people influences their ideas, attitudes, and behaviors. Because of the Individuals do not exist in isolation, so their connections will provide opportunities and create constraints at the same time. For this reason, paying attention to the actual connection of people becomes more essential. *Second*, work often happens through interactions outside of formal reporting and working relationships (informal). Understanding informal networks are especially important in the work environments where formal structure provides little guidance. *Third*, leadership occurs through relationships. Leadership requires network perspective to observe and recognize connections between groups accurately. All people should contribute to the process of direction, alignment, and commitment to shared challenges. Thus, leadership may add throughout the relationship.

*Fourth*, successful leaders develop networks of healthy and influential relationships. Strategic and authentic networking is the key to improving strong networks that prevent insularity. *Fifth*, network knowledge is an asset in change efforts. Vertical channels alone hinder capacity to adapt to disruption. Adaptive capacity of organization or community may be sped up by mobilizing informal networks capacity to span boundaries. Understanding these connections and approach is critically important in cultural transformation because organizational culture lives mainly within the relationships between people. *Sixth*, innovation networks can be identified and supported. Creative ideas are essential and must be actualized in the organization or community for the better future. Network structures should facilitate creativity within group or community. Agencies need networks that support the generation and sharing of diverse ideas as well as collective action. *Seventh*, the most critical challenges leaders face today are interdependent. Complex challenges cannot be addressed by individuals alone. They can only be solved by groups of people working collaboratively across boundaries (hierarchies, geographic regions, functional silos, stakeholder interests, and demographic differences). An informal network perspective is a key to thriving in a world in which everything is connected.

## 2. Social Network Analysis

There has been a long tradition in Sociology to quantitatively study the impact that social networks have on individual attitudes and decision making (Birke, 2013). Research on social networks has rapidly increased and diffused into a variety of different disciplines. Network analysis is the process of getting useful, accurate information about the organization's network by looking at the connections between people. Modern social network analysis is understanding the interactions between actors or agencies rather than a focus exclusively on their attributes. It allows leaders to see the networks within their organization, identify leverage points, and assess change in networks over time (Cullen, *et.al.* etc). Network analysis can be used to develop better understanding of community-based network and facilitate network development

(Robertson, *et.al*, 2012). Our network approach locates leadership not in the attributes of individuals but in the relationships connecting individuals. People in organizations and as representatives of organizations tend to enter exchange relationships, not with complete strangers, but with family, friends, or acquaintances. Embeddedness at the system level can refer to a preference for interacting with those within the community rather than those outside the community. We emphasize people's perceptions of others as leaders are reflected through the sets of embedded ties within which people are located (Balkundi & Kilduff, 2006)

Social network analysis (SNA) is one tool for evaluating leadership networks. It is particularly useful for those who are seeking to influence policy, disseminate new frameworks and ideas, and mobilize resources towards a common goal. Furthermore, the methodology of SNA has contributed to the formulation of many qualitative concepts such as power, cohesion, fragmentation, reciprocity, hierarchy, cliques, and alliances (Bandyopadhyay, *et.al*. 211:5) It is a valuable tool for understanding where there are gaps in a network that represents opportunities for recruiting new members. It can highlight silos or communication barriers within an organization or community. What makes social network analysis unique is the capacity to visualize a system of relationships otherwise would be hidden from view. What is missing from social network analysis is the story behind the relationships (e.g., what people did together as a group or community and what difference it made) (Hoppe & Reinelt, 2010)

SNA provides a set of theories, tools, and processes for understanding the relationships and structures of a network. The “nodes” of a network are the people (it may be individual people, groups, or other collectives) and the “links” are the relationships between people. Links can be “undirected” (two people communicate with each other, shares information with, etc.) or “directed” (one person sees another as a source of leadership, seeks advices from, etc.). The number of links exist in a network divided by the maximum possible number of links that could exist in the network is called “density”. Network density helps us to define clusters. Nodes are used to represent events, ideas, objects, or other things. In short, SNA produce maps or pictures that display the patterns of connections between the nodes of the network (Bonding, Bridging, Weak Ties, String Ties, Clusters, The core, the periphery, etc.).

*Bridger/Brokers/Boundary Spanners* are individuals in a network who have connections to different clusters. are critical to gathering and transferring information from disparate parts of the organization and are especially important for implementing organizational change efforts meet the needs of different groups. Brokers and boundary spanners can become bottlenecks. If they leave, the network may become fragmented. Finding bridgers in a network is typically done with the calculation called “betweenness centrality” (how often one individual is likely to be an important relay point between other network members?).

*Hubs/Central Connectors* are individuals in a network with the most influence. They have a large number of direct connections. They have greater access to information that resides in network and they direct and distribute this information to others. However, they can create bottlenecks of information flow or decision-making—and put the organization in a vulnerable spot if they leave. Finding hubs in a network is typically measured by using directed links and “indegree centrality” calculation (how many relationships point towards an individual?). Individuals who have higher in-degree

values because it is more likely that lay people seek advice from them may become an opinion leader in their network or community (Kim, 2007). *Peripheral players* have few network connections and appear isolated. They are often newcomers to the organization. For some individuals, being on the periphery was a concern; for others, it was an effective place to be. For example, individuals who often connect with others outside the organization may be peripheral players from an internal network perspective.

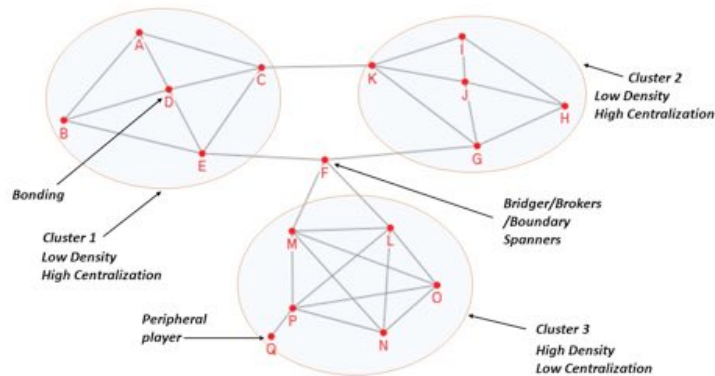


Figure 1. Structure and Relationship of Social Network (Mapping by author using NodeXL Pro)

Informal networks measured with two basic questions related to communication network and friendship network (Zohar & Tenne-Gazit, 2008). Examples of communication network questions are: “How much do you talk with other members related to such activities?” We can ask respondents to write the appropriate answer using a scale ranging from 1 (*very little*) to 5 (*always*). Friendship network can be illustrated with the questions such as: “With which of members do you consult, get help, or get advice about your personal issues?” Respondents were asked to mark the appropriate names appearing in the table (*multiple choice*). This question is known to record close friendships rather than friendships at large (Wasserman & Faust, 1994).

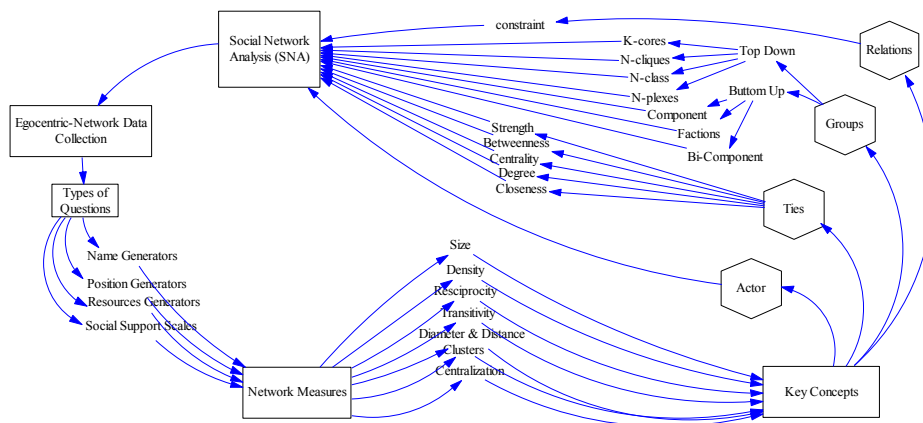


Figure 2. The Key to Explore: Methods and Measures for Egocentric Network Analysis

*Informal network density* was calculated after dichotomizing the communication network. For instance, frequencies rated between 1 and 3 received the value 0—no tie; whereas 4 to 5 (much and very much) received the value 1—direct tie. The friendship network that was measured in dichotomous terms required no changes before calculating density. The density coefficient is computed by the sum of all direct ties, divided by the maximum possible number of direct ties (Wasserman & Faust, 1994). *Informal network centralization* was calculated with Freeman’s (1979) degree-based centralization index. Such analysis requires separation between *out-degrees* and *in-degrees*. The in-degree for the communication and friendship networks measures the centrality of an actor in the network, that is, how many have chosen that actor as their friend or to communicate with.

**Table 2.** Key concepts in social network measurement

Terms	Definition
Egocentric network analysis	Local network analysis, views a social network as particular actor’s set of connections.
Name Generators	Question that ask respondents themselves to identify members of their network (list of his or her alters)
Position Generators	Question that ask respondents to report on whether they have contacts (alters) in certain social positions.
Resources Generators	Question that ask respondents to identify whether they know alters are useful for any specific purpose.
Social Support Scales	Question that ask respondents to report on whether they have access to others who could provide support.
Size	Size is simply a measure of the number of nodes in the network.
Density	Density refers to the number of ties in the network reported as a fraction of the total possible number of ties.
Reciprocity	The degree to which actors in a directed network select one another. Reciprocity based on the “dyads”
Transitivity	A complete network that reflects the social structure’s tendency toward stability and consistency. Transitivity based on the “triad”
Diameter and Distance	Diameter and Distance indicate how well resources can move from one part of the network to another. A network’s diameter refers to the longest path between any two actors.
Cluster	Clustering is a measure of a network’s actors’ tendency to “group together” into pockets of dense connectivity.
Centralization Network	Only a small and exclusive set of actors hold position of power and control.
Decentralized Network	Power and control are diffuse and spread over a number of actors.
Degree	Degrees refers to the number of ties an actor either sends (out-degree) or receive (in-degree).

### 3. Results and Discussion

An emphasis on embeddedness, social capital, structural patterning, and social relations between actors is the most important distinguishing feature of the network research (Balkundi & Kilduff, 2006). In network terms, leadership embodies the four principles we articulated earlier. Based on these principles, leadership can be understood as social capital that collects around certain individuals—whether formally designated as leaders or not—based on the acuity of their social perceptions and the

structure of their social ties. Patterns of informal leadership can complement or complicate the patterns of formal leadership in organizations.

Individuals can invest in social relations with others, can structure their social networks by adding and subtracting relationships, can reap rewards both in terms of their own personal performance and organizational unit performance. There are some emphasize of research for exploring informal leadership network (Robins, 2015:41) such as: (a) The effect of social environment to individual and leadership outcomes (b) the effect of network partners to leader and individual (c) The network flow from one individual to another (d) the effect of individuals to the network structure (e) the evolution of network structure (f) the process of self-organizing and (g) the effectiveness of networked social system.

### 3.1. Peer leadership network

Peer leadership is the capacity of people who share similar identities, circumstances, or contexts to provide each other with trusted and relevant information, advice, and support when it is needed most (Hoppe & Reinelt, 2010). A system of social ties among leaders who are connected through shared interests and commitments, shared work, or shared experiences. Leaders in the network share information, provide advice and support, learn from one another, and occasionally collaborate together. Peer leadership networks provide leaders with access to resources that they can trust. Leadership development programs often seek to create and catalyze peer leadership networks to expand the trusted ties that leaders have with one another.

At other times peer networks emerge when leaders with something in common and personal benefit in sharing and connecting their experiences. Relationship questions such as “how well do you know this person” and “how often do you communicate one-on-one with *this person*” are useful survey questions for this type of assessment. Allowing respondents range of options is especially helpful (e.g., “*I don't know this person,*” “*I know this person somewhat,*” and “*I know this person well*”). Successful peer leadership networks will transform many “don't know” relationships into “know somewhat” relationships. “Know well” relationships are more likely to develop when peers collaborate on a project.

**Table 1.** Example of Survey Questions/Evaluations for peer leadership network

How much do you like to play with this person at organization/community?	Responses were numbers 1–5
How much do you like to work with this person at organization/community	Responses were numbers 1–5
How close do you feel to this person?	Responses were numbers 1–5
What fellows here in (organization or community) do you go around with most often?	Multiple choices, Give both first and last names
Please indicate whether you think the people listed in each row/column as personal friends	Corresponding cell/matrix
Are there some people who hang around together a lot? Who are they?	Open questions
Are there some people who don't hang around with a particular group? Who are they?	Open questions

Source: Adopted from Carrington & Scott 2011

### 3.2. Organizational leadership Network

Organizational leadership is the capacity to set direction, create alignment and maintain commitment to get work done (McCauley & Van Velsor, 2004). A set of social ties that are structured to increase performance. These ties are often informal and exist outside the formal organizational structure, such as when an employee seeks advice from a colleague other than her supervisor to help solve a problem more quickly. At other times, teams or communities of practice are intentionally created to bridge silos within organizations that interfere with performance, profit, or delivering on one's mission. At the inter-organizational level, leadership networks support organizations with shared interests to produce a product or deliver a service more efficiently. Research for evaluating the impact of leadership development on organizational leadership networks includes: (a) identification of the bridgers in the network (b) access of information through network and (c) the leader's strategy to foster innovation and share information with others (Robins, 2015:41).

**Table 2.** Example of Survey Questions/Evaluations for organization leadership network

<i>From time to time, most people discuss important matters with other people. Looking back over the last three months...</i>	
Who are the people discussed matters important to you?	Open questions, Write the first names or initials
Who are the people with whom you discuss personal matters that are important to you?	Open questions, Write the first names or initials
Who are the people you usually ask for this kind of help (outside the formal structure)?	Open questions, Write the first names or initials
Who are the people with whom you usually do things together (outside the formal structure)?	Open questions, Write the first names or initials
Whom would you ask to lend you the money (a person, not an institution)?	Open questions, Write the first names or initials

*Source: Adopted from Carrington & Scott 2011*

### 3.3. Field-policy leadership Network

Field-policy leadership is the capacity to influence how problems are framed and solutions envisioned, to mobilize people to take action around a shared vision, to develop and enact innovative solutions to complex problems, and to participate actively in policy decision-making (Hoppe & Reinelt, 2010). A network connecting leaders who share common interests and who have a commitment to influencing a field of practice or policy. These networks seek to shape the environment (e.g., the framing of an issue, underlying assumptions, and standards for what is expected). Effective field-policy leadership networks make it easier for leaders to find common ground around the issues they care about, mobilize support, and influence policy and the allocation of resources. Some of the research in an evaluation of the impact of leadership development efforts on field-policy leadership networks (Robins, 2015:41) include: (a) the evidence of greater sharing and collaboration within and between network's members? (b) mapping the network expansion (likely and unlikely alliances) (c) the evidence of sharing across groups and the reason behind that network (d) the network of coordination and mobilization of network's members to engage in policy activism, and (e) the networks contribution to positive policy changes and to creating more coherent fields of practice.

**Table 3.** Example of Survey Questions/Evaluations for Field-Policy leadership network

<i>Do you know anyone who ...</i>	
Can collaborate with you?	Open questions, Write the first names or initials
Is handy solving technical problem in your office/community?)	Open questions, Write the first names or initials
Has power for mediating policy problem in your office/community?)	Open questions, Write the first names or initials
Knows a lot about governmental regulations?	Open questions, Write the first names or initials
Can give a good reference when you are applying for ....?	Open questions, Write the first names or initials

*Source: Adopted from Carrington & Scott 2011*

### 3.4. Collective leadership Network

Collective leadership is “the capacity of a group of leaders to deliver a contribution in service of the common good through assuming joint and flexible leadership, according to what is perceived and required” (Kunkel, 2005). A self-organized system of social ties among people attracted to a common cause or focused on a shared goal. Network members exercise leadership locally. As the number of local groupings grows and there is increasing interaction, these groups begin to align and connect to form larger networks. These networks are often rooted in a sense of community and purpose; they may be driven by a desire to achieve a specific goal, or simply by the desire of each member to belong to something larger than oneself. Below is a list of the types of questions we asked (Robins, 2015:41);

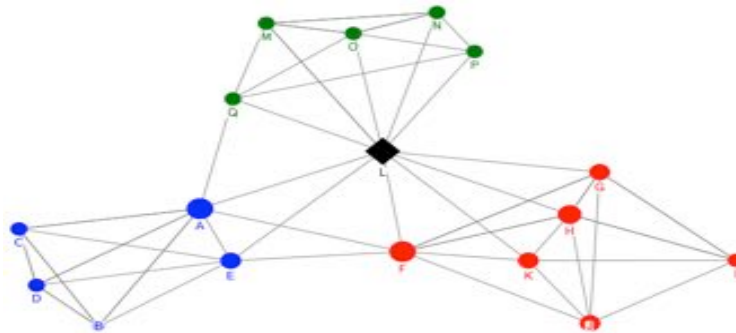
- Is network membership growing?
- Is the proportion of members who are active in the network growing?
- Is network membership increasingly diverse?
- Are members engaging in multiple kinds of activities provided by the network?
- Are members coming together in different combinations in the network?
- Are members both bonding and bridging in the network?

**Table 5.** Example of Survey Questions/Evaluations for collective leadership network

Do you spend your social time with friends who live outside the neighborhood?	Yes-No Questions, If Yes Responses were numbers 1–5
Do you have any good friends that you feel close to?	Yes-No Questions, IF YES: About how many good friends do you have?
On an average, about how many people do you have contact with in a typical day, including all those who you say hello, chat, talk, or discuss matters with, whether you do it face-to-face, by telephone, by mail or on the internet and whether you personally know the person or not?	Select one from the following categories that best matches your estimate: (1) 0–4 persons, (2) 5–9 persons, (3) 10–19 persons, (4) 20–49 persons, (5) 50–99 persons, (6) over 100 persons
Would you say all your friends know one another?	most of your friends know one another, only a few of your friends know one another, or none of your friends know one another?

*Source: Adopted from Carrington & Scott 2011*





Graph Metric	Value
Graph Type	Undirected
Vertices	17
Unique Edges	28
Edges with Duplicates	30
Total Edges	58
Self-Loops	0
Connected Components	1
Single-Vertex Connected Components	0
Maximum Vertices in a Connected Component	17
Maximum Edges in a Connected Component	58
Maximum Geodesic Distance (Diameter)	4
Average Geodesic Distance	1.875433
Graph Density	0.316176471

Vertex	Size	Degree	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality	PageRank
L	40.0	11	57.226	0.048	0.118	2.010
A	22.5	7	27.200	0.038	0.072	1.364
F	22.5	7	17.207	0.040	0.094	1.283
H	18.1	6	5.329	0.034	0.082	1.115
E	13.8	5	10.333	0.036	0.061	0.992
G	13.8	5	5.129	0.033	0.071	0.950
J	13.8	5	1.164	0.029	0.064	0.955
K	13.8	5	5.129	0.033	0.071	0.950
C	9.4	4	0.333	0.026	0.033	0.860
D	9.4	4	0.333	0.026	0.033	0.860
I	9.4	4	0.200	0.024	0.050	0.793
M	9.4	4	0.667	0.030	0.044	0.838
N	9.4	4	0.250	0.030	0.044	0.840
O	9.4	4	0.250	0.030	0.044	0.840
P	9.4	4	0.667	0.030	0.044	0.838
Q	9.4	4	3.583	0.033	0.049	0.827
B	5.0	3	0.000	0.026	0.024	0.681

**Figure 3.** Example of Informal Network

*Graph density.* The number between 0 and 1 indicating how interconnected the community members in the network. The graph density is calculated by dividing the number of total edges by the maximum number of possible edges. For our network (fig 3) the graph density score is 0.3. A higher score of density graph (e.g., 0.6, 0.7) would include more total edges for the same number of vertices.

*Average geodesic distance.* The average of all geodesic distances. This value gives a sense of how “close” community members are from one another. If it is high, many individuals in the social network do not directly know each other. People may be connected through a friend of a friend of a friend of a friend, but not through short paths. If it is low, most people know one another either directly or through a mutual friend.

*Maximum geodesic distance (diameter).* The geodesic distance is the length of the shortest path between two people.

#### 4. Conclusion

We live in the age of network where everything connected. Our capacity to collect and analyzes formal or informal network data within our organization and community has obviously transformed such discipline and fields, including leadership studies. Social Network Analysis (SNA) science has enabled our research to deal with complex networked social systems. We need a more empirical study that is solidly grounded in a specific organization or community context. SNA helps us to measures and evaluate how “close” and “connect” the members of the community are and how “effective” and “efficient” information flew from one to another, within or between different group (cluster) as well. Finally, mapping the informal network of organization and community would be an opportunity to develop and build a capacity of organizational and community leadership by strengthening the ties and relationship among leaders and members.

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