leadership dynamics research institute

THE POWER OF ORGANIZATIONAL SOCIAL INFRASTRUCTURE:
DISCOVERING INFORMAL ORGANIZATIONAL INFRASTRUCTURE
THROUGH MEASURES OF RELATIONSHIPS

Presented at the ASQ World Conference on Quality & Improvement on May 2, 2007 by:

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SUMMARY

The formal organizational structure of an enterprise does not necessarily reflect how the work of the organization is actually accomplished. On the other hand, the informal infrastructure of the organization – whether or not it matches the formal structure – plays a key role in accomplishing the work of the organization. Social network analysis is a powerful tool for understanding the organization's informal infrastructure, then using that infrastructure to measure and benefit from social relationships to enhance enterprise stability and agility. It is important for organizational leadership to recognize the value of relationships, the impact of social networks on the work of the organization, the nature of social network analysis, and its value in identifying the informal infrastructure of the organization. Measurements of the strength and quality of relationships can then assist in efficiently and effectively focusing resources to build and sustain organizational relationships.

INTRODUCTION

Social networking has emerged as a hotspot for focusing of marketing efforts. For example, with over 95 million members, MySpace.com has attracted as much as 4.5% of all website hits in the United States, so it has become an attractive site for advertisers. (WikiPedia, 2006.) The emergence of this site from among over 200 social networking sites has significantly increased public awareness of the value of social networks. Yet while the organization's marketing division is focusing on the advertising value of social networking, organizational leadership may not yet be aware of one of the most significant tools of organizational development: the use of social network analysis to measure, understand and support the social networks within the organization.

An organization's identity is in large part a product of the internal and external relationships it supports. These relationships form the social infrastructure of the organization. While organizations have become very effective at mapping and controlling processes, they have yet to widely utilize the tools which are now becoming available to map and manage their informal organizational infrastructure. By discovering this infrastructure, organizational leadership can manage and support those relationships to enhance their ability to effectively lead the organization.

The tools of social network analysis provide the means of identifying those relationships and mapping the informal organizational infrastructure created by them. In addition, an understanding of the dimensions of relationships can assist in measuring the quality and depth of those relationships. In combination, five dimension thinking and social

network analysis measurement tools provide a powerful means of mapping and managing the organization's social infrastructure.

THE POWER OF RELATIONSHIPS

The relational dynamic is demonstrated in a survey developed by Dr. Lindon Robison asking the least amount the participant would accept for his or her $3,000 car from a nasty neighbor, from a complete stranger, from a childhood friend, and from a sibling. Winder, 2000. The results of this survey among several groups are included in Chart 1. Similar results in a buyer questionnaire indicate that where there is a relationship, a buyer will pay more. As these combined results demonstrate, where there is a

Selling Price Patterns for $3,000 Car			
	Nasty Neighbor	Complete Stranger	Childhood Friend	Sibling
	65	0	0	0
$3,500	263	39	2	0
$3,250	21	33	5	1
$3,000	236	476	122	29
$2,750	11	30	135	24
$2,500	4	22	298	199
	0	0	38	348
Total	600	600	600	600

Chart 1. Selling Price Patterns for $3,000 Car.

relationship, a seller will accept less and a buyer will pay more. Robison and Schmid. This increases the trading range, and increases the likelihood that a trade will take place. But more important than that, the trade takes on a different dimension—the trade begins to flow from the relationship, providing resilience in the relationship and a foundation for on-going trading. Baker and Dutton identify this tensility effect ("the capacity to bend and withstand stress in the face of setback or challenges") as an important element of High Quality Connections. See Dutton and Heaphy. When these dynamics begin to take effect, a participation dynamic develops in which participants begin to contribute resources to a common endeavor. Participants give more than required; they become "sustaining members" of the organization through repeat purchases or long-term employment; and they begin to share the vision of the organization with others through "word-of-mouth" advertising of customers, and by employees creating "moments of truth" that live on in the minds of customers. This dynamic, which will be discussed in depth later, is

referred to as "value sharing." At this point, the participants are no longer strangers or outsiders to the organization, but they are an integral part of what the organization is all about. They become a part of its infrastructure and, in a very real way, shape the character of the organization. In other words, the organization would not be the same without their integral participation.

While the economic impact of relationships is significant, the influence of relationships on organizational infrastructure is just as profound. Imagine an organizational environment in which participants give more than required, become sustaining members, and share the vision of the organization or undertaking. Imagine an environment in which the work of the organization is described as "what can we do together?" rather than "what can I get them to do?" Imagine an organization whose staff members simply do what needs to be done, not because of the incentives they receive for doing so, but simply because it needs to be done. Imagine an organization where staff are free to seek input and technical assistance not only from their upline managers, but from others within as well as outside the organization who have information which would help them be more productive.

Relationships are elemental in the philosophies of Deming, Covey, and Senge. Deming notes that "people are born with a need for relationships with other people, and the need for love and esteem by others." (Deming, 1993, p. 111.) In fact, this perception of the value of relationships is basic to understanding Deming's psychology component of his Theory of Profound Knowledge. Intrinsic motivation is borne out of this need for relationships, in contrast with the more independent extrinsic motivation. Moreover, interdependence is a basic part of Deming's concept of Systems Thinking, another element of his Theory of Profound Knowledge. He notes that "a system is a network of interdependent components that work together to accomplish the aim of the system." (Deming, 1993, p. 50.) In fact, the need for communication and cooperation increases as interdependence between components increases. (Deming, 1993, p. 98.)

Similarly, relationships are at the heart of Covey's principle-centered leadership. It is the process of building relationships of trust that provides a foundation for empowerment and alignment in the organization. It is the relationships which are established at the interpersonal level which permit empowerment at the management level and alignment

at the organizational level. (Covey, 1993, p. 251.) Covey notes that duplicity and backstabbing, which destroy relationships, sow the seeds of destruction in an organization.

Senge significantly deepens our insight into the importance of relationships. Rather than building from a base of components or individuals, he builds from a framework of the whole or the community. The three key guiding ideas that Senge identifies are 1) the primacy of the whole, 2) the community nature of the self, and 3) the generative power of language. (Senge, Kleiner, Roberts, Ross, and Smith, pp. 25-27.) The primacy of the whole "suggests that relationships are, in a genuine sense, more fundamental than things, and that wholes are primordial to parts. We do not have to create interrelatedness. The world is already interrelated." (Senge, Kleiner, Roberts, Ross, and Smith, p. 25.) The community nature of the self "challenges us to see the interrelatedness that exists in us." (Senge, p. 26.) Just as the whole is primordial to the part, the community is primordial to the individual. The individual does not exist independent of the community of which he or she is a part. ("Community" can include a unit as small as a team or family or as large as an organization, city, or nation.) The generative power of language "illuminates the subtle interdependency operating whenever we interact with 'reality.'" (Senge, Kleiner, Roberts, Ross, and Smith, p. 27.) It permits us to participate in shaping the world that we perceive. It permits us to keep active our view of the territory rather taking a snapshot of the territory and thereafter seeing this snapshot as the territory. That static view of reality would prevent us from seeing and responding to the constant changes in the territory.

The value of relationships, then, is that relationships, not things, are primordial. Community, not individuals, are primary. Individuals are an interdependent part of community, not independent beings merely existing in proximity with one another. At times the needs of the individual in the short term may take precedence over the needs of the community, but even then, the focus is on the long-term good of the community (of which the individual is a part) as well as the individual within that community. The primary perspective begins with the whole, not the parts. The whole is not the same as a collection of the parts. Our focus on fixing parts is on restoring the integrity of the whole.

If we apply Senge's thinking to the organization we realize not only that the organization is composed of an array of social networks, but more importantly, *the organization is a social network.* The organization's very existence is a product of relationships and social ties built around its reason for being. Without those relationships, the organization would have difficulty existing, and it certainly could not prosper.

The reason that the whole (rather than the parts) is the basic unit is that the value of the individual or part or component is not just its position or proximity in the process or system or community, but also its dynamic relationship to all other individuals in the community or components in the system. If a part is seen as a thing, separate and apart from its dynamic relationship, a major, essential portion of its character is not even accounted for. It is for this reason that Dr. Deming tells of the parts that are produced to specifications by two different manufacturers; yet one part works and the other does not. The manufacturer whose part works knows the place of the part in the system; the other does not. (Deming, 1986, p. 140.) The successful manufacturer accounts for the relational dynamics associated with the part and which are part of the part's character; the unsuccessful manufacturer does not.

Similarly, Deming describes a firm which wanted to begin manufacturing high-quality pianos. So they purchased a Steinway piano and disassembled it to use the Steinway parts as a pattern for their manufacturing operations. Of course, they were not successful in building a high quality piano, so they decided to salvage their loss and reconstruct the Steinway. Without an understanding of the dynamic relationship of the parts, the Steinway which they rebuilt was not same as the Steinway they purchased, so they were not even able to recoup the cost of the piano they had purchased as a model. The value of the part, then is not only in its size and shape, but in its dynamic relationship to the other parts which make up the whole. (Deming, 1986, p. 129.)

SOCIAL NETWORK ANALYSIS

Is there a human analogy to the Steinway incident? According to Kleiner, there is. Kleiner notes that "the effectiveness and power of an individual . . . depends not just on his or her position in the hierarchy, but on the person's place in a variety of intertwined networks." Kleiner highlights social network analysis work by Professor Karen Stephenson, who describes a flawed CEO transition in a research and development subsidiary of a telecommunications company. The person selected to

replace the CEO was well-connected socially with the retiring CEO, but did not have the necessary knowledge of the division and had not built an essential social network to be connected with the knowledge within the division which would be needed to effectively run it. When the new CEO was appointed, the person who had the knowledge and who had established an effective knowledge network left the firm, leaving a significant void. The new CEO was let go by the Board after three months. A competent manager was appointed CEO and was able to build the network he needed to tap into the knowledge base of the division; but the division lost growth momentum and suffered long-term damage as a result of a lack of awareness of the informal infrastructure.

It begins with a tie. . .

Just as Senge notes that relationships are more fundamental than things and that interdependency exists within us, the basic element of social network analysis is the relational "tie."
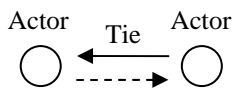
Figure 1. A Social Tie

In social network analysis, an "actor" is linked with another actor through a social "tie," which reflects the linkage between the actors (see Figure 1). This linkage can reflect a wide range of attributes, such as friendship or common background. It can also reflect a choice of association or a transfer of resources. An actor can have multiple ties with multiple actors, although it is the tie which is under study which is relevant to the analysis. The tie may also vary in strength, from a strong tie (such as

Figure 2. A Social Network.

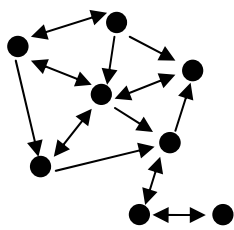multiple weekly contacts with friends) to a weak tie (such as occasional contact with friends). The above example illustrates two of several ties which Professor Stephenson uses in her analysis of an organization's informal infrastructure: the work tie ("With whom do you exchange information as part of your daily work routines?") and the social tie ("With whom do you 'check in,' inside and outside the office, to find out what is going on?"). Kleiner.

The tie, then, becomes the thread which weaves the fabric of the social network among actors, through ties with multiple actors (see Figure 2). The tie may be a one-way tie (e.g., an actor seeks help from another) or it may be a reciprocal tie (e.g., both actors help each other). Actors with multiple ties may be a "hub" or "connector" with access to gather and share information from throughout the network. Actors with ties to actors not within a "group" may serve a "bridging" or "boundary spanner" function with actors outside the group. Since they have ties to actors with fresh information from outside the group, they may perform an innovation function within the group. Actors which have incoming ties from a number of other actors but do not have as many outgoing ties may be "experts" whose advice is sought in their area of expertise. A subgroup can exist where there are common characteristics among its members, as well as where the strength of relationships is stronger among the actors within the group than it is with actors outside the group, as a whole. An actor who has ties to several subgroups may serve as an "information broker" and may serve a "gatekeeper" function to regulate the flow of information among subgroups. See Wasserman and Faust; Krebs 2006; Kleiner; Cross and Prusak.

The value of social network analysis in uncovering how decisions are made in the organization is illustrated in Krebs' (2003) social network analysis of decision making in a division of a major corporation. See Figure 3. Krebs first mapped the formal organizational and management reporting structure (the organizational hierarchy, represented by the dark double lines between actors). Then over this he mapped the extent to which a person sought out another specific person for input, opinions, and advice before making an important decision (represented by the light grey lines with an arrow to indicate the direction in which input was sought). He learned that there was significant input among the managers of two of the four directors (directors 2 and 3) not only within their departments, but with the general manager and even outside the organization. The other two departments showed a social network structure in line with the organizational structure, except that in one department in which the new director (director 1) did not seek input from the director's managers, the managers sought input from the manager who wanted the director position but who was turned down for the position when the existing director was given the position. The informal infrastructure clearly shows the collaborative nature of departments 2 and 3, the direct-
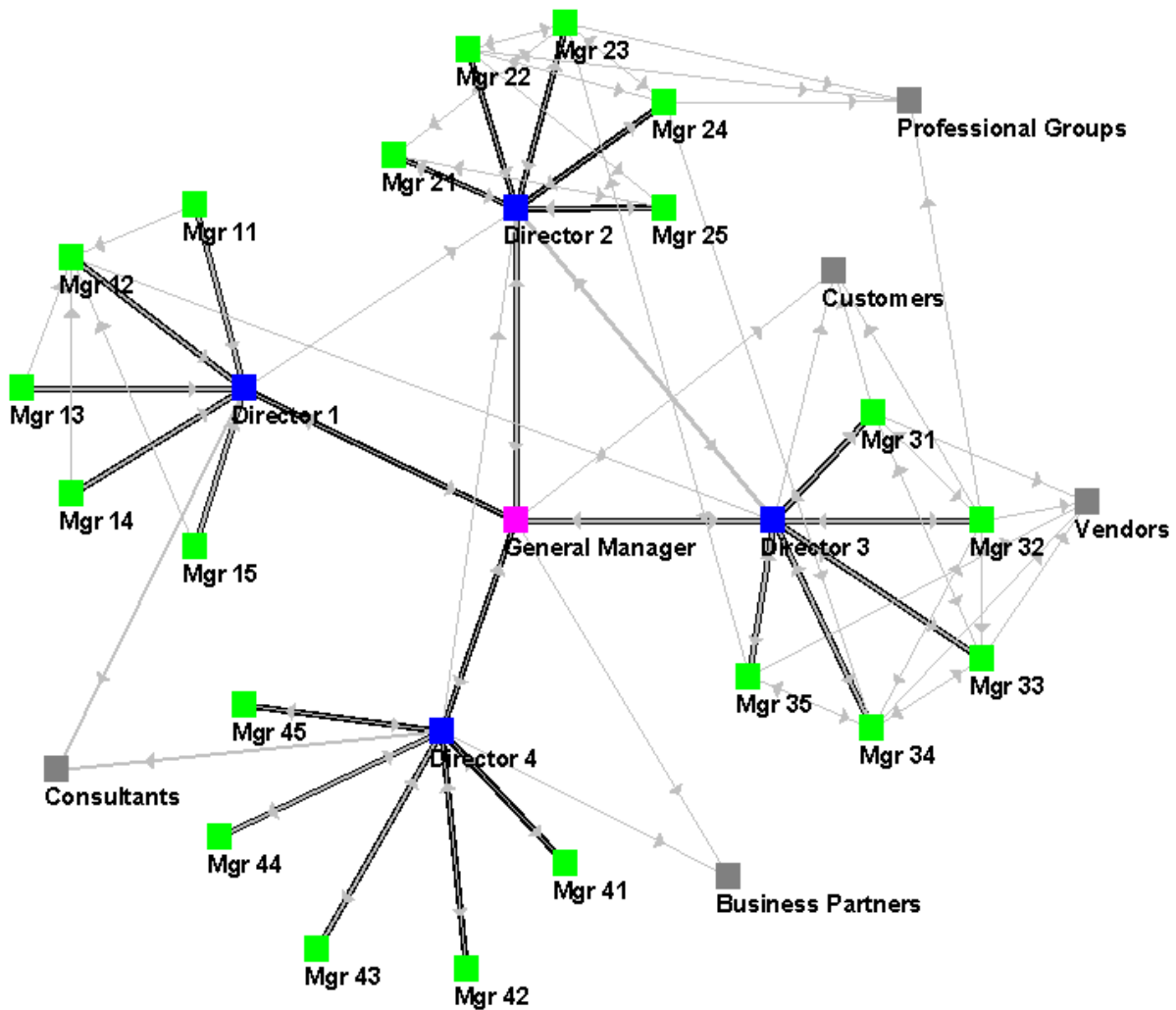
Figure 3. Hierarchy + Decision-Making Conversations. Copyright 2003 Valdis Krebs. Used with Permission.

report structure of department 4, and the command and control nature of department 1.

Frank and Zhao demonstrated the power of social networks in the diffusion of technology in a school system. A school district instituted a district-wide implementation of Windows operating systems in its schools. One of the schools in the study had been using the Macintosh platform, and so there was little or no expertise in Windows in the school. Some of the staff took summer courses, and the district assigned a teacher with Windows experience as a teacher in the school. This teacher assisted other teachers who were teaching at her grade level, resulting in a few small increments in technology use, but because there was a strong grouping in the school by grade level, the teacher was not able to have significant influence beyond the other teachers at her grade level. However, this teacher formed a collegial tie with a teacher in another grade level who had ties with other teachers at her grade level as well as at other grade levels. It was the influence of the teacher in the other grade level which resulted in substantial changes in Windows computer use not only within that teacher's grade level, but also among other grade levels.

THE DEPTH AND QUALITY OF RELATIONSHIPS

The relational function focuses on building the network of relationships that are needed to fulfill needs and accomplish the vision of the organization. Quality itself has been defined as fundamentally relational: "Quality is the on-going process of building and sustaining relationships by assessing, anticipating, and fulfilling stated and implied needs."

(Winder, 1993.) Even those quality definitions which are not expressly relational have an implicit relational character. Why do we try to do the right thing right, on time, every time? To build and sustain relationships. Why do we seek zero defects, conformance to requirements, or six sigma? To build and sustain relationships. Why do we seek to structure features or characteristics of a product or service that bear on their ability to satisfy stated and implied needs? (ANSI/ASQC.) To build and sustain relationships. The focus of continuous improvement is, likewise, the building and sustaining of relationships. It would be difficult to find a realistic definition of quality that did not have, implicit within the definition, a fundamental express or implied focus of building and sustaining relationships. See Winder, 1996

As noted above, there are five dimensions of relationships. (See Table 1 and Chart 2 at the end of this article for a review of the Five Dimensions.) The dimensions of relationships include action, interaction, connection, interconnection, and community. Social network analysis has now provided tools to measure these levels of relationship.

 Action is a first dimension function. Action is doing. Covey notes an important element of action: we are free to choose our response, or action. However, action does not exist in a vacuum. Underlying action are the vision, the competencies and the paradigms on which it is founded. Competencies deal with a person's ability, or capability. They are a product of experience. As a person gains experience, it expands his or her frame of reference, increasing his or her ability to understand and perform. How well we are able to act in response to particular need is a function of our competencies. On the other hand, why we act as we act is a function of our paradigm, and our basic desire to act is a function of our vision. If we have no vision, our acts may be random and without order or reason because there is no structure to hold them together. The nature of our paradigm can influence action. A greed paradigm may invoke a different action than a caring paradigm; or, the paradigms may invoke a similar action, with different underlying motives.

The competency, vision, and paradigms of an individual are what make up his or her character. Consequently, since action takes all of these into account, action can be a revelation of character. What a person chooses to do or chooses not to do can be an indication of his or her underlying nature. In this manner, action can reflect a person's underlying vision, because in the long run a person will not act—indeed, cannot act—inconsistent with his or her true vision. Thus, if a person's vision is completely in alignment with the vision of the organization, his or her actions will reflect the vision of the organization. In this manner, the person not only believes in or is committed to what the organization represents: he or she *is* what the organization represents.

The principle which enhances action is confidence. Confidence is a firm belief in one's powers, abilities, or capabilities. It denotes a feeling of emotional security resulting from faith in oneself. It is this level of being true to oneself that engenders trust and builds a trusting relationship, which is essential for building the social network ties that are needed within an organization. Confidence also engenders internal and external consistency and makes it possible for others to continue to expect the actions they have always expected, also an important aspect of building trust and maintaining ties.

While the basic element of social network analysis focuses not on the actor, but on the tie, yet the action dimension provides an understanding of the characteristics of the actor, which are important in the analysis of relational ties. The action dimension is the source of the attributes of an actor which form the basis for establishing many of the ties which are measured. For example, an actor's competency in a particular field of interest may be the basis on which the actor is sought out by others in need of his or her expertise. On the other hand, an actor's lack of a needed competency may cause the actor to establish ties outside the organization (such as with a consultant or a mentor) to gain access to those competencies, resulting in the actor performing a bridging function for the organization. Attributes are also a basis on which commonalities are identified in social network analysis, and are thus useful in identifying "clusters" (cliques, groups, or sub-groups) with common characteristics in a social network.

 Interaction is a second dimension (measurement) function. While action can be taken at an individual, personal level, interaction involves action between two actors. It raises the level of accountability from a personal measurement of internal integrity (whether a person is true to the truth within himself or herself) to one of accountability in relation to others or to a common good.

The measurement function plays a key role in interaction dynamics. Although there are a number of motives and circumstances surrounding interaction, the principal dynamics of interaction involve two key measurements by each participant in the interaction: 1) "What can I use?" and 2) "What can I contribute?"

The focus on one or both of these measurements, although normally unconscious, is a key building block of interdependence and relationships. For example, a total focus on "what can I use" can lead to a greed-based paradigm, where the focus is on getting and hoarding resources without regard to the needs of other participants who may be supplying those resources. This is the foundation of the "scarcity mentality" described by Covey, and it destroys the trust that is essential for building the type of ties that are needed to sustain the organization. On the other hand, a total focus on "what can I contribute" can "sink the ship" if needed resources are squandered. It is the fine-tuned balance between these two measurements that leads to not only contribution of resources to a common good but also responsible use of resources. It is the blending of these measurements that provides the foundation for empowerment, which entails the responsible use of resources for the common good (i.e., the vision) of the organization and its participants.

Without the contribution dynamic, the leader cannot entrust resources to the participants, and he or she will instead try to control the resources, further destroying the trust relationship. Lack of responsible use of resources is simply one form of using resources inconsistent with the vision of the organization and constitutes waste. This "loose cannon" dynamic builds on itself: the irresponsible use of resources (inconsistent with the organizational vision) erodes trust, resulting in the natural tendency to impose control in order to restore or maintain order; but the imposition of control actually further destroys trust.
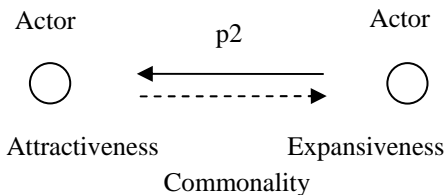

Figure 4. Wasserman's p2 model

In social network analysis, Wasserman's p2 model (see Figure 4) can be used to identify and measure the propensity for an interaction as well as reciprocation based on the characteristics of the sender and the receiver. It is used to measure a dyadic (two-actor) relationship. The model assumes one of the actors, the sender of the tie, has expansiveness characteristics such as thirst for knowledge or gregariousness which would encourage initiating an interaction, and the other actor, the receiver of the tie, has attractiveness characteristics such as being a nice person or having formal authority or money, which would attract an interaction from a the sender of the tie. There may also be characteristics which the actors
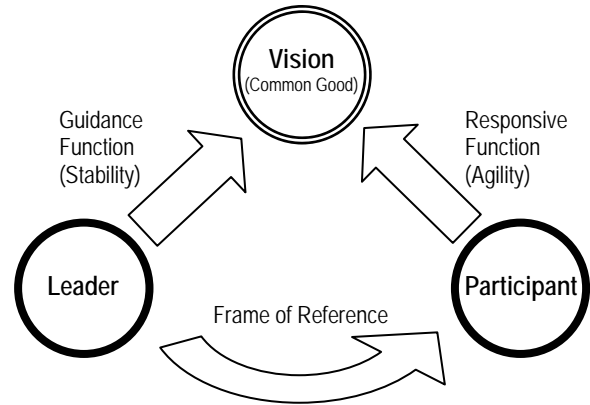

Figure 5. The Guidance and Responsive Functions of Leadership

hold in common which would facilitate the interaction, such as similar beliefs, similar social status, similar age, or similar sources of information.

The expansiveness and attractiveness characteristics of the p2 model are embedded in the guidance and responsive functions of Winder and Draeger's leadership model (see Figure 5). The leader's "how can I help you" responsiveness function is a "what can I contribute?" function of the interaction dimension. The leader's "here's how I can help you" is also a "what can I contribute" function with an emphasis on the leader's guidance. The leader's "what can I use" provides the basis for reciprocation by the participant. The participant's "how can you help me?" focuses on the participant's "what can I use" measure; while the participant's "what will it cost me?" focuses on the participant's "what can I contribute" measure.

Both the leader and the participant have the attractiveness and the expansiveness characteristics. The leader's attractiveness characteristics (i.e., why would the leader be sought out by the participant?) are 1) the guidance the leader can provide to the participant in resolving a problem or addressing a need of the participant and 2) the resources the leader can

bring to bear to address the participant's needs. The leader's expansiveness characteristics (i.e., why would the leader seek out the participant?) are 1) the desire to meet the needs of the participant which are consistent with the leader's vision, along with 2) the resources the participant will provide to the leader in exchange for the leader's addressing those needs. The participant's attractiveness characteristics (i.e., why would the participant be sought out by the leader?) are the leader's expansiveness characteristics (the participant has needs the leader can address and the participant will pay to have them addressed) and the participant's expansiveness characteristics (i.e., why would the participant seek out the leader?) are the leader's attractiveness characteristics (guidance from the leader and use of leader's resources to meet needs). This reciprocity built in to the guidance and responsive functions of leadership provide agility and stability for the organization – agility through the leader's responsiveness to needs and stability through the guidance the leader gives in addressing those needs. In addition, understanding of the social infrastructure of the organization will assist the organization in becoming more agile and responsive to individual needs, and the organization's agility in responding to needs will enhance its stability by making it more resilient precisely as a result of its responsiveness to needs.
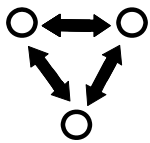
Connection is a third dimension function. Connection is more than interaction. It is interaction toward a common good in order to fulfill a common need. Nevertheless, interaction is the building block for connection. Connection is based on multiple interactions which are combined to provide the resources and competencies to achieve an end that could not be accomplished by any of the participants individually. Thus, connection performs a synergy function.

The team is the most effective tool of connection. Ideally the team will have all the participants needed to provide the competencies and resources to accomplish the vision of the team. But even the necessary resources and competencies will not be sufficient without communication and contribution by team members. It is their contribution of their unique competencies and the resources related to those competencies that provides the synergy that makes the whole of the team greater than the sum of its individual parts or members. The team is the basic unit of the organization. Too much structure in an organization can reduce the ability of the team to function effectively. This contrast is illustrated in Krebs' (2003) network analysis of the organizational structure, noted above, where one department was
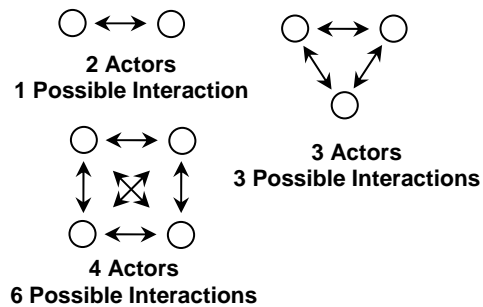

Figure 6. Number of possible interactions increases as number of team members increases

heavily structured along formal organization lines and did not facilitate team interaction among the managers (see Figure 3).

The size of a team can dramatically affect the communication and contribution function. See Figure 6. With a team of three there are three possible interactions: an interaction between each team member. With a team of four there are six possible interactions. With a team of five there are ten possible interactions. The number of possible interactions increases on a curvilinear basis as the number of team members increases. The formula is the summation of 1 to n-1, where n represents the number of team members. The number of possible interactions for a team of ten members is 45 (1+2+3+4+5+6+7+8+9). Since there are two possible ties between two actors (one coming from the actor and one going to the actor), there are twice as many possible ties as there are potential interactions. So for a team of ten, there are ninety possible ties.

It is virtually impossible to have interaction among all participants of a large team, so social network analysis can help identify where team leadership emerges by measuring ties among team members. *Business Week* describes the process Sasho Cirovski, head coach of the University of Maryland men's soccer team, used to review the social network of the team in order to identify current and emerging soccer team leadership. He was surprised to learn that the person with significant influence was a "promising local rather than a sought-after recruit." He immediately made the player a third co-captain of the team, and the chemistry of the team began to change,

resulting in four straight College Cup appearances and a 2005 NCAA Championship.

Because of the complexity of team dynamics, an essential principle of connection is alignment. It is alignment that provides the integrating power to raise interaction to the level of connection. In fact, alignment is essential for effective empowerment: a "loose cannon" is a person who is given authority and resources to act, but whose actions are not in alignment with the team or organization's vision. It is alignment at the team level that provides the team's reason for being. The contribution of team members must be in the context of the purpose of the team in order to fully support the synergy of the team.

Wasserman's p* (p-star) model (see Figure 7) helps identify this social structure, although at the expense of measuring the effect of attributes in the p2 model. However, the models can be used in conjunction with each other to measure propensity for the tie based on attributes with the p2 model, then measure the social structure with the p* model. The p* model is a measure of a triadic (three-actor) relationship. Its focus is on the intermediaries and the influence the intermediaries (e.g., other team members) have on a particular actor, rather than on the actors' characteristics.
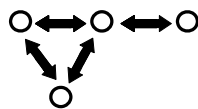
Interconnection is a fourth dimension function. It is interconnection which permits us to see things through "different eyes" and to expand our frame of reference. As a consequence, interconnection assists us in "seeking first to understand" by permitting us to see things through the eyes of customers and other participants. The paradigm is an elemental part of interconnection, because it creates the environment in which the organization operates. An organization built on a paradigm of distrust will have a much greater structure through rules, policies, and procedures than one built on a paradigm of trusting relationships. Heavy structure can get in the way of fluid ties.

The paradigm provides the logic for the behavior of an organization. What may appear as illogical under one paradigm may be completely logical under another. For example, under a distrust paradigm, it would be illogical to give employees authority and resources to act outside of well-defined parameters. But under a "win-win" trust paradigm, such authority is perfectly logical.

Organizational leadership plays a very important role in molding the paradigm of the organization. Covey notes that a manager with a "scarcity mentality" will build destructive competition right into the structure of the organization. In the social network analysis context, this might happen, for example, when a "gatekeeper" attempts to maintain power by restricting the flow of information to those who need it (e.g., "You always have to come to me for this information.")

Interconnection is the fabric which permits interaction among teams and between teams and individuals outside the team. But it is essential to understand that, while the team or organization may be perceived as an entity, all interaction will take place
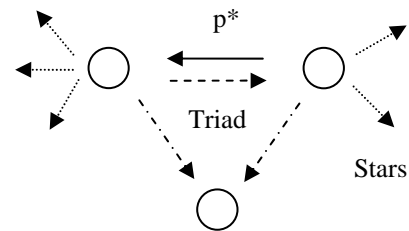

Figure 7. Wasserman's p* model

between individuals. This heightens the importance of each person's vision being in alignment with the vision of the team and the organization, and each person having the authority to act as necessary. The actions of the person actually involved in the interaction will help formulate the other person's perception of the team or organization. If the vision of the interacting team member is not in alignment with the vision of the team, the other person will nevertheless attribute those actions to the team, and will thus incorrectly perceive the vision of the team. On the other hand, with alignment, the "moments of truth" in which action is taken consistent with the vision of the team will actually reinforce positive perceptions of the vision of the team.
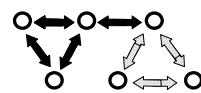
Moreover, the person with whom the team member is interacting may be part of one or more broader, unseen network(s) or team(s), and the positive interaction will serve as a stimulus for that person to share the vision of the team or organization within his or her network (i.e., through word-of-mouth advertising).

Corporate character is a product of all interactions with the members of an organization. If all are in alignment with the desired corporate vision,

then the corporate character will reflect the desired corporate vision. If that alignment does not exist, then corporate character will reflect something other than that vision.

Empowerment is the principle that is essential for effective interconnection. Through empowerment (authority to use resources as needed, consistent with vision) a person can assist in meeting needs when they arise as they arise, rather than having to obtain approval from team members or superiors. This makes the empowered team member much more responsive to the needs of internal and external customers. With alignment already in place as part of team dynamics, the team member can be trusted to use the resources appropriately, so imposition of strict controls is not necessary. However, it is important that alignment extend beyond team boundaries to the organization level, to ensure that sub-optimization does not take place to the detriment of the organization.

Wasserman's p* model can capture the effect of third party interactions through the "star" portion of the model (ties that extend beyond the triad, but are accounted for in the actors in the triad). See Figure 7. For example a team member may speak to a customer (a "star" or tie extending from the team member) and gain insights which she then relates back to her team members. It is not necessary to measure the customer as part of this process, because the customer's tie with the team member is reflected in the team member's tie with the other team members. Thus, in Frank and Zhao's study of the diffusion of technology in a school, the Windows-experienced assigned teacher did not have direct ties with all teachers in the school, but her learning was reflected to many teachers in the school system through her direct tie with a teacher who already had developed many ties across subgroups in the school.

Note that the relationship of a team member with a person outside the team can be a "two-way street" (a reciprocal tie), in which the team member is not only assisting the person outside the team but is also being assisted by that person. These actors perform a bridging function and are "boundary spanners." They can have significant influence on the innovation of the team or organization because they are bringing fresh input to the team from an outside source (e.g., the "voice of the customer"). For example, in Figure 3, managers 23 and 24 seek input not only within their division, but also from managers in division 3 as well as from professional groups;

manager 32 also seeks input from vendors, customers, and professional groups.

This boundary spanning function accounts for a serendipitous innovation effect resulting from the *Voices of the Staff* (VOICES) Program at the University of Michigan. This program was established in 2005 to create a formal mechanism for university staff members "to help identify and share ideas about the campus community issues that matter most to staff" (i.e., a one-way tie in which information is sought from volunteers but not by volunteers). VOICES was established as more than a feedback mechanism for the administration – it also addressed the need to engage VOICES participants in a meaningful way and utilized research-based engagement strategies to do so. The 100 to 120 VOICES members serve for two-year staggered terms, so that half of the group is new each year. VOICES has six network groups, with 15-20 volunteers each, addressing issues in Career Development, Faculty and Staff Communication, Health and Wellness, Parking and Transportation, Recognition and Performance Management, and Rewards and Benefits. VOICES members represent a complete cross-section of the university population, including all levels of staff and faculty; all university Vice President areas; and demographic representation of the faculty and staff population. In essence, VOICES volunteers are a microcosm of the university. What is intriguing about the VOICES Program that although its initial focus was a one-way tie, it has emerged as a mechanism for a two-way, reciprocal tie in which VOICES volunteers also seek information for their group or department. Consequently, the VOICES Program has created a cadre of boundary spanners who not only provide significant input for the university administration, but also bring back ideas (which they learn through their ties with other VOICES members and through the VOICES Program) to implement innovative programs within their own departments or groups. For example, one VOICES volunteer helped initiate a performance management system; another arranged for training within her group on university benefits to assist staff in enhancing their personal benefits through an understanding of available benefits options; and another is initiating a career development program for his staff.
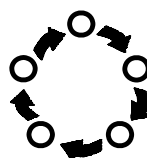
 Contribution to the community takes us beyond the organization boundaries to the broader world community. Reaching to the community provides the

heightened sensitivity and receptivity to our surroundings. This actually assists us in recognizing and understanding dynamics and in responding to needs.

One characteristic of quality over the past decade is that organizational boundaries have become fuzzier as organizations have become more responsive to customer needs and have extended themselves to the broader world community. Many organizations now see themselves as part of this community rather than simply as traders dealing with this community. This dynamic is becoming more and more common as focus in quality has shifted to "delight the customer." This responsiveness to customer needs transcends the outmoded customer satisfaction standard and approaches a new level at which individual and organizational focus is truly toward "what can I contribute" rather than "what can I use." This new level approaches and utilizes "value sharing," the highest dimension in the five dimension hierarchy. Winder (1993). Value sharing is described as follows: "If I give something to you that has more value to you than it does to me, then together we are better off as a result of the trade." Value sharing incorporates the concept of the social tie with the built-in assumption that value to the recipient is value to the contributor. The measures of value sharing include: participants give more than required, they become "sustaining members," and they share the vision.

Frank has termed the social network measurement for this dynamic as "identification with the collective as a quasi-tie." In his study of the diffusion of technology in the school systems, he found that although there is a tendency to only help those with whom the actor has a tie, those who were helped had a tendency to help other staff in need of help even without a pre-existing tie. He notes that where identification with the collective serves as a quasi-tie, the diffusion of information becomes much more efficient because the social network places the resource closer to the actor in need than the formal structure does (i.e., the reach of the "formal structure" – the teacher with Windows expertise who was assigned as a teacher in this school in order to disseminate the Windows expertise – was limited, but was expanded by those who volunteered to help others). This measure can provide significant insight into the informal infrastructure of the organization and be a means of facilitating more efficient operations.

Baker and Dutton describe this effect as "generalized reciprocity" (sometimes called "third-party reciprocity"), in which the exchange of help and assistance is not directly between two people, but rather "takes place between three or more people in a chain of reciprocity (e.g., "A helps B, B helps C, C helps D, and D helps A"). They note that generalized reciprocity is prevalent in communities of practice. Krebs and Falkowski used social network analysis to discover and establish communities of practice at IBM much more effectively and efficiently than if assignments had been made along organizational lines. Because the participants "identify with the collective" (IBM) they are willing to engage in generalized reciprocity and share their expertise with others even though they may not have an existing direct tie with the person using the information. The effect of this is to bring the resource closer to each actor, thus increasing the efficiency in the sharing of these knowledge resources, an effect Baker and Dutton have also noted.

"Identification with the collective as a quasi-tie" and generalized reciprocity embrace the concept of value sharing and are consistent with Winder's (1993) measures of value sharing: giving more than required, becoming "sustaining members," and sharing the vision. Customers who "identify with the collective" of the company become part of the unseen network of social infrastructure which is supporting the organization by their repeat purchases (they become "sustaining members" or, in network analysis terms, they develop a "strong tie") and word-of-mouth advertising (they "share the vision," or in network analysis terms, they become "boundary spanners" for the company). In fact, Reichheld supports the validity of the hierarchy of these measures through the single question he asks customers in order to determine the "net promoter score," which is a measure of the level of customer support for the organization. The question is, "How likely is it you would recommend us to a friend or colleague?" "Promoters," who answer with a 9 or 10 (on a scale of 0 to 10), account for the highest repurchase rate (the "sustaining member" or "strong tie" measure) and account for 80% of the referrals the company receives (the "share the vision" or "boundary spanner" measure). They almost seem like part of the company's sales force, and their "identification with the collective" of the company leads to generalized reciprocity on behalf of the company, making the company more efficient in reaching new customers. On the other hand, detractors (who answer 0-6) account for 80% of the negative word of mouth. Reichheld makes recommendations as to where a firm can put its resources to address this informal social

network in order to improve overall customer loyalty and corporate profits.

CONCLUSION

Organizations <u>are</u> social networks and are founded on the relationships they have built and supported. Senge has emphasized that interrelatedness does not have to be created—it already exists—but it can be expanded and strengthened. Social network analysis has given us the tools to measure those relationships so we can discover the informal infrastructure of our organizations and actively manage, support, and strengthen that infrastructure. The five dimensions of relationships, coupled with advanced tools of social network analysis, permit us to investigate the depth and quality of the social fabric that keeps our organizations in operation. The strongest of those relationships is the value sharing dynamic in which participants give more than required, become "sustaining members," and share the vision of the organization. Social network analysis now gives us the tools to not only identify those relationships, but to also measure their strength.

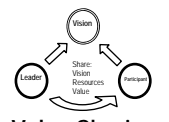|	**THE FIVE DIMENSIONS**
	Five distinct, literal dimensions of quality provide a framework for assessing, planning, and implementing quality improvement efforts and can assist in identifying the informal organizational infrastructure of an organization. See Chart 2.
Experience	Experience is a first dimension function. In this single dimension things are actually done. "Dreams become reality." It is literally one dimension, represented by a string of incidents, such as a stream of consciousness story. Its power is that unless it is fulfilled, plans remain plans and are not put into action. Its value is that 1) it is the means (and the only means) of bringing vision into reality; and 2) it provides a basis for learning.
Measurement	Measurement is a second dimension function, which is essential to leadership. It provides a means of assessing not only whether something was done, but also how well or how poorly it was done and its impact. It also provides us with a means of assessing the needs that are an integral part of the vision, and assessing resource capacity available to meet those needs. In this manner, this dimension provides us with knowledge of the system. Two measures integral to relationships are "what can I use?" (a stewardship function) and "what can I contribute?" (a contribution function).
Relationships	Relationships and systems thinking are third dimension functions which enable us to see the relationship between actions and results, and to organize processes and systems which capture those relationships to increase efficiency. This dimension gives us the power to identify leverage points where action can be taken to establish systems and processes and generate improvements. In addition, interpersonal relationships are an essential part of leadership and create the ties of social networks. Implicit in the "sharing" function of leadership is the recognition of relationships.
Interconnectivity	Interconnectivity, or paradigm logic, permits us to view results and relationships from a different perspective—through new eyes—which enhances our understanding and leads to innovation and change. This shift in paradigms can provide new logic which then provides a powerful foundation for innovation and change in an organization. This dimension is also the home of intuition, which can contribute significantly to the innovation function.
Value Sharing	Value sharing, the highest dimension, is the dimension of the whole. It permits us to see where value exists and how it can be shared for maximum efficiency and effectiveness. This dimension is illustrated by the phrase, "If I give you something that has more value to you than it does to me, then together we are better off as a result of the trade." This dimension is expressed in the phrase "delight the customer" (give the customer more than he or she is paying for, or dedicate resources to the customer). Value sharing plays a crucial role in developing and sustaining the relationships that are so essential for the organization. The primary measures of value sharing are: 1) participants give more than required (e.g., delight the customer); 2) participants become sustaining members (e.g., repeat customers and long-term employees); and 3) participants share the vision (e.g., word of mouth advertising by customers, or employees who create what Jan Carlzon, 1987, of Scandinavian Airlines called "moments of truth" for customers). The leadership model is the symbol of value sharing because value sharing is made operational through leadership. Leadership is the integrated sharing of vision, resources, and value to induce positive change. Vision is defined as the common good in the relationship, or the linking of the needs of the participant with the resources of the leader.

Table 1. The Five Dimensions

The Five Dimensions of Quality

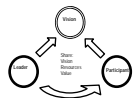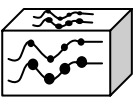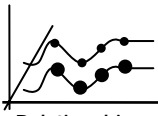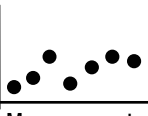by Richard E. Winder, Lindon J. Robison, and Daniel K. Judd

Dimension	Quality Function *Deming Cycle*	Driving Force *Stage of Growth*	Communication *Dynamics*	Philosophy *Interaction*	Psychology *Maslow*	Operational Model	Relationship	Domain *Golden Rule*	Principal Paradigm
Value Sharing 5th	Value Sharing ("Delight the Customer") (1) AIM	Passion and Compassion; Internal Desire / *Fulfillment or Maturity Stage*	Dialogue ("I found myself completing his sentences.") / *Structures*	Charity; Justice and Mercy (Caring) / *Community*	Integrative Psychology; Agape (Love) / *Actualization*	Leadership (Sharing of Vision, Resources [Human, Information, and Capital Resources], and Value)	Dedication; Mutual Participants for common good ("Lose self: gain all")	Free Will "Do unto others as you would have them do unto you."	Value Sharing ("Delight the Customer")
Interconnectivity 4th	Interconnectivity (Paradigm Logic) (2) PLAN	Conscious Choice; Inner Drive, Intrinsic Reward, Commitment of the Heart; Ethics; Moral Values / *Growth Stage*	Conscience or Intuition; Paradigm Shift (Empowerment) / *Archetypes*	Wisdom; Distributive Justice ("Do the right thing") *Interconnection*	Conative Psychology (Conscience, Instinct, Intuition) *Esteem*	Principle-Centered Leadership (Mission Development and Resource Utilization)	Mutual Promises "Partners" by agreement; Associates ("Win-Win")	Partnership "At the end of the rainbow we'll find our pot of gold."	Partnership ("Help each other grow")
Relationships 3rd	Relationships (Systems Thinking) (5) ACT	Habits & Processes; Duty; Obligation; Association; Goal Orientation; Extrinsic Reward / *Success Stage*	Consensus; Understanding; Commitment (Agreement) / *Trends*	Passion, Feelings, Sensitivity; Commutative Justice ("Care about it") *Connection*	Affective Psychology (Spirit, Emotions) *Social*	Management (Structured Management & Management by Objective)	Quid Pro Quo; "Parties" to legally binding contract ("Fair trade")	Contractual "Go for the gold."	Achievement ("Get ahead")
Measurement 2nd	Measurement (4) STUDY (CHECK)	Awareness; Incentive or Compensation; Control / *Survival Stage*	Communication; Discussion (Two-way: "Tell and Listen") *Patterns*	Knowledge; Retributive Justice--Reward ("Do it right") *Interaction*	Cognitive Psychology (Mind) *Safety*	Bureaucracy (Department-alization) (Two Dimensions)	Challengers; "Objects" which help achieve goals ("Win-Lose")	Competitive "He or she who has the gold rules."	Competition ("Get ahead of them")
Experience 1st	Experience (3) DO	Stream of Consciousness; Power; Greed; Fear; Apathy / *Existence Stage*	Conveyance ("Tell and Sell") / *Dynamics; Random Forces*	Actions; Retributive Justice--Punishment ("Do it!") *Action*	Behavioral Psychology (Body) *Physiological*	Tyranny or Autocracy (One Dimension)	Collusion; Blame; "Victims" of the other party, who blocks achievement of goals; ("Lose-Lose")	Enforcement "Bury it!" ("If I can't have it, he or she can't either.")	Punishment ("Get back" or "Get even") or Apathy ("Why bother?")

Operational Model nested labels (top to bottom): Encompasses All Five Dimensions — Utilizes Four Dimensions — Three Dimensional — Two Dimensional — One Dimensional

Chart 2. The Five Dimensions of Quality.

ACKNOWLEDGEMENTS

REFERENCES

ANSI/ASQC. 1987 Quality Systems Terminology, American National Standard A3-1987.

Baker, Wayne and Dutton, Jane E. 2005. Enabling Positive Social Capital in Organizations. Chapter to appear in *Exploring Positive Relationships at Work: Building a Theoretical and Research Foundation*. Jane E. Dutton and Belle Rose Ragins (Eds.). Lawrence Erlbaum, Inc., 2006.

Covey, Stephen R. 1993. *Principle-Centered Leadership*. New York: Summit Books.

Cross, Rob and Prusak, Laurence. The People Who Make Organizations Go – Or Stop. *Harvard Business Review*. June 2002.

Deming, W. Edwards, *The New Economics*, Cambridge, Mass.: Massachusetts Institute for Technology, Center for Advanced Engineering Study, 1993.

Deming, W. Edwards, *Out of the Crisis*, Cambridge, Mass.: Massachusetts Institute for Technology, Center for Advanced Engineering Study, 1986.

Dutton, Jane E. and Emily Heaphy. The power of high quality connections. In Kim Cameron, Jane E. Dutton and Robert E. Quinn (eds.) *Positive Organizational Scholarship*. San Francisco: Berrett-Koehler. 2003.

Frank, K.A. (Forthcoming) A Theory and Empirical test of Identification with the Collective as a Quasi-tie. Special issue of *American Behavioral Scientist*, guest edited by Pamela Paxton and James Moody.

Frank, K. A. and Zhao, Y. (2004). "Subgroups as a Meso-Level Entity in the Social Organization of Schools." Chapter 10, pages 279-318. *Book honoring Charles Bidwell's retirement*, edited by Larry Hedges and Barbara Schneider. New York: Sage publications

"Game Plan: First Find The Leaders." *Business Week*. August 21, 2006, online edition, http://www.businessweek.com/magazine/content/06_34/b3998437.htm.

Kleiner, Art. Karen Stephenson's Quantum Theory of Trust. *Strategy + Business*. Issue 29, 4th Quarter, 2002.

Krebs, Valdis, Decision Making in Organizations. http://www.orgnet.com/decisions.html. 2003.

Krebs, Valdis, An Introduction to Social Network Analysis. http://www.orgnet.com/sna.html. 2006

Krebs, Valdis and Falkowski, Gerry. 2005. Discovering Communities of Practice at IBM.
http://www.orgnet.com/emergent.html

Reichheld, Frederick. 2006. The Microeconomics of Customer Relationships. *MIT Sloan Management Review*.
Winter 2006.
Robison, Lindon J. and A. Allan Schmid, "Interpersonal Relationships and Preferences: Evidences and
Implications, *Handbook of Behavioral Economics*, Vol. 2, Roger Frantz and Harinder Singh, eds., J.A.I. Press,
1989.

Senge, Peter M. 1990. *The Fifth Discipline*. New York: Doubleday/Currency.

Senge, Peter M.; Kleiner, Art; Roberts, Charlotte; Ross, Richard; Roth, George; and Smith, Bryan. 1999.
The Dance of Change. New York: Doubleday/Currency.

University of Michigan, Voices of the Staff Inaugural Year Report 2005-2006.
http://www.voices.umich.edu/images/report0506.pdf

Wasserman, Stanley and Faust, Katherine. *Social Network Analysis*. Cambridge: Cambridge University Press.
1994 (1999 Edition).

Wikipedia. MySpace.com. 2006

Winder, Richard E. Five Dimension Leadership. In *The 54th Annual Quality Congress Proceedings*.
Milwaukee: American Society for Quality. 2000.

Winder, Richard E., "Fulfilling Quality's Five Dimensions," 47th Annual Quality Congress Transactions, May 24-
26, 1993.

Winder, Richard E. and Draeger, Justin. Resilient Leadership. *2006 World Conference on Quality and
Improvement*. Milwaukee: American Society for Quality. 2006.

Winder, Richard E. and Judd, Daniel K. 1996. Organizational Orienteering: Linking Deming, Covey, and Senge
in an Integrated Five Dimension Quality Model. In ASQC Seventh National Quality Management Conference
Transactions. American Society for Quality Control.