A Social Network Perspective on Knowledge Management

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INTRODUCTION

Social networks—the sets of relations that link individuals and collectives—have implications for the speed and effectiveness with which knowledge is created and disseminated in organizations Both social networks and knowledge management (KM) are complex, multifaceted phenomena that are as yet imperfectly understood. Not unsurprisingly, our understanding of the interface between the two is similarly imperfect and evolving. There are, however, a number of foundational concepts upon which existing thought converges as well as a body of emerging research that offers practical and conceptual guidance for developing the kind of network best suited for managing different kinds of knowledge. In this article, we introduce rudimentary network concepts, briefly recapitulate KM and organizational learning concepts related to networks, and then explore some of the interfaces between social networks and KM.

RUDIMENTS OF SOCIAL NETWORK ANALYSIS

There are two fundamental dimensions of social networks: transactional content and configuration. These in turn have both direct and indirect interactions on each other and on knowledge dissemination if not on both creation and transfer of knowledge. Configuration refers to "shape" of a network (Nelson, 2001). For instance, some networks look like stars, with actors connected only to a central person. Some look like spider webs, with a dense center, but with some connections between peripheral actors (Handy, 1995). Other networks, such as those typified by unrestricted markets, exhibit more random patterns.

Important for an individual within a network is the degree to which he or she fills a "structural hole" between members of the network. A structural hole refers to a gap in a network which isolates one set of actors from another. Individuals whose personal ties bridge such gaps can exercise a "brokerage" role which benefits them personally and facilitates the flow of information and resources through the network. There are at least two other important configurational aspects of an individuals networks; centrality and structural equivalence. Together they constitute what Galaskiewicz and Wasserman (1993) identified as the core constructs defining of social structure:

1. Actor centrality is the degree to which the ties in a network converge upon an individual actor. Thus, if actor A is connected to everyone in a network and no other actors entertain ties to each other, actor A has maximum centrality. Centrality has been measured in various ways from simple counts of sociometric nominations to measures based on the number of geodesics linking each actor, but space will not permit a discussion of these nuances. Common to all measures is the idea that central actors can reach or directly contact other members of the network more easily than less central actors.
2. Structural equivalence is the degree to which the patterns of individual networks are similar. People who are tied to the same people are said to be structurally equivalent. For instance, two professors who team teach the same course would have rather similar patterns of ties, at least with their students. Supervisors on a day and night shift in the same factory also would have somewhat similar network patterns. Because strict equivalence is quite rare, scholars have sought to develop less constraining definitions of equivalence. Actors with similar network structures but with connections to different actors are said to have "regular equivalence" for instance. An example would be quarterbacks on opposing football teams. In practice, equivalence is usually measured using clustering algorithms which group similar network patterns together.
3. Bridging relationships are idiosyncratic relationships that link otherwise unconnected groups or individuals. This concept is very similar to both

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Burt's brokerage and Freeman's "betweenness" constructs.

To Glaskiewicz and Wasserman's constructs must be added a fourth—the concept of density. Density refers to the overall number of contacts in a network compared to the number of ties possible. In a "sparse" network, there are few connections between people. In a "dense" network everyone is connected. Density is expressed as a ratio of realized to possible ties. The network of four people sharing six ties has a density of 1. One containing three ties has a density of .5. The overall density of a network or a network's subregion is closely related to virtually every other network dimension.

Transactional content refers to the kind of relationship that exists between two actors rather than the shape of the network or the actor's position within the network. Many types of relationship are possible, including influence, information exchange, advice, emotional support, antagonism, and exchange of goods and services. However, to date, the most commonly used way to classify the transactional content of a network is the concept of "tie strength" developed by Grannovetter (1973). In addition to formalizing the concept of tie strength, Grannovetter was perhaps the first to recognize the relationship between tie strength, network configuration, and the dissemination of information.

The strength of a tie is a combination of the amount of time, the emotional intensity, and the extent of reciprocal services which characterize the tie. In general, the stronger the tie the more easy it is for one actor to influence and convey complex, multifaceted information to another. At the same time, strong ties tend to be resistant to change and stifle innovation. They also tend to clump together into incestuous cliques, creating many structural holes in a network that are difficult to bridge and that create conflict in social systems (Nelson, 1989; Uzzi, 1997). The relationship between tie strength, network configuration, and information transfer is probably the single most important network finding and its implications for KM and surfaces in one way or another in almost all studies of networks and KM.

DIMENSIONS OF KNOWLEDGE AND KM

Although most readers will be acquainted with KM and related concepts, it will be useful here to summarize a few central constructs so that our discussion of the relationship between networks and KM will be based on common understandings and definitions. We briefly restate commonly used definitions of knowledge and knowledge management. Nonoka (1994) defines knowledge as "a justified belief that increases an entity's capacity for effective action." He also affirms that knowledge is created and organized by the flow of information, anchored on the commitment and beliefs of its holder (Nonoka, 2002).

It is important to distinguish between data, information, and knowledge. The primary distinction between the three lies in the degree to which they are organized and useful. Data are raw stimuli with little organization or ready utility (Avali & Leidner, 2001). Data become information when they are processed and organized in a systematic way. Information becomes knowledge when it is ready to be used to orient action. In Davenport, Long, and Beers' terms, "Knowledge is a high value form of information that is ready to apply to decisions and actions (Davenport et al., 1998, p. 43). An important type of knowledge is tacit knowledge, which, while it is useful, is difficult to codify, transmit, and convey (Schön, 1983). Tacit knowledge contains data that are processed, organized, and useful, but the underlying logics of their organization are frequently complex, implicit, and ambiguous. Tacit knowledge is important to the solution of problems that are intractable, complex, extremely variable, or all of the above. As phenomena become better understood and solutions more routine, the knowledge necessary for their processing becomes more explicit, and solution procedures more codified, so that producing information from data becomes simpler and more routine.

Generating knowledge, be it tacit or explicit, is a complex task. Nonoka (1994) identifies four interrelated related processes leading to knowledge creation: knowledge socialization, knowledge internalization, knowledge externalization, and knowledge combination. Almost by definition, the processes of knowledge socialization and externalization if not combination and internalization will be influenced by the nature and distribution of individual and collective networks. Most views of KM recognize that it has both social and technological dimensions which need to be integrated, and that KM has broad aims involving organizational culture, transparency, and agility of processes, and the development of infrastructure that is harmonious with individual needs and organizational context.

For Davenport and Prusak (1998), most KM projects have one of three aims: (1) to make knowledge visible and show the role of knowledge in an organization; (2) to develop a knowledge-intensive culture by encouraging and aggregating behaviors (e.g., knowledge sharing); and (3) to build a knowledge infrastructure—not only a technical system, but a web of connections to encourage interaction and collaboration. Again, social networks would logically limit or enhance visibility, culture, and infrastructure.

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