Chapter 3.6
Use and Methods of Social Network Analysis in Knowledge Management

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INTRODUCTION

Whilst the primary importance of informal communities of practice and knowledge networks in innovation and knowledge management is widely accepted (see Armbrecht et al., 2001; Brown & Duguid, 1991; Collinson & Gregson, 2003; Jain & Triandis, 1990; Lesser, 2001; Liyanage, Greenfied & Don, 1999; Nahapiet & Ghoshal, 1998; Nohria & Eccles, 1992; Wenger, 1999; Zanfei, 2000), there is less agreement on the most appropriate method for their empirical study and theoretical analysis. In this article it is argued that social network analysis (SNA) is a highly effective tool for the analysis of knowledge networks, as well as for the identification and implementation of practical methods in knowledge management and innovation.

Social network analysis is a sociological method to undertake empirical analysis of the structural patterns of social relationships in networks (see, e.g., Scott, 1991; Wasserman &

Faust, 1994; Wellman & Berkowitz, 1988). This article aims at demonstrating how it can be used to identify, visualize, and analyze the informal personal networks that exist within and between organizations according to structure, content, and context of knowledge flows. It will explore the benefits of social network analysis as a strategic tool on the example of expert localization and knowledge transfer, and also point to the limits of the method.

BACKGROUND

Words have meanings: some words, however, also have a 'feel'. The word 'community' is one of them. It feels good: whatever the word 'community' may mean, it is good 'to have a community', 'to be in a community'. (Bauman, 2001, p. 1)

The term "community" is widely used, yet imprecisely defined in the sociological literature.

Whilst there is consensus that community is a fundamental unit of social organization, there is little agreement on how best to describe it as a sociological entity (see Poplin, 1979, pp. 11-12). The fact that the term "community" refers to different things, depending upon who is using it and upon the context in which it is used, can render it useless for scientific purposes (see Poplin, 1979, p. 4). Nevertheless, the use of the community concept, or community "metaphor," is flourishing in the social sciences, as well as in political debates and management strategies. One of the foremost applications of the term is in the domain of knowledge communities or communities of practice.

One alternative approach is to view communities as networks. Drawing on the methods and tools of sociometry, the development of formal approaches to social networks began with Moreno (1934), and was systematized and fundamentally elaborated by means of graph theory (König, 1936) through Cartwright and Harary (1956). The breakthrough of social network analysis as a method of structural analysis was reached in the 1960s by White and his Harvard colleagues (see Scott, 1991, pp. 33-38; for a review of the large number of applications of social network analysis, see, e.g., Wellmann & Berkowitz, 1988).

A conceptualization of communities as social networks was outlined by Poplin (1979) in his analysis of community literature as a "network of interaction" (pp. 14-18). In Poplin's view, there is at least one major advantage in conceptualizing communities in this way: "It serves well as a tool by which to describe systematically the inter-relationships of the various units that compose the community. This alone can help increase our understanding of community structure and process" (p. 16). Poplin's perspective helps us to build the case of communities of practice as social networks. In doing so, it provides us with both a unit of analysis and the means to develop and employ an empirical method and practical tool, that of social network analysis. The provision

of a conceptual framework and powerful tool for the analysis of informal social structures is emphasized here as its major advantages.

USE

Informal knowledge networks are not a new invention in the knowledge management literature. Crane (1972), for example, published her widely recognized study on the diffusion of knowledge in scientific communities. Even earlier, the classic Hawthorne studies included in their principal report of 1939 various sociograms that the research team saw as reflecting the "informal organization" of a bank's wiring room (as opposed to the formal organization depicted by the organization chart) (see Roethlisberger & Dickson, 1947, pp. 500-548). Whether speaking about communities of practice, knowledge communities, or knowledge networks, all these concepts have a common core that can be subsumed under the "social capital" construct. Burt (2000) elaborates upon this point and suggests that the social capital concept is essentially "a metaphor about advantage" (p. 2), that is, the better the social connections between people, the higher the collective and individual returns for them. Cross, Parker, and Borgatti (2002) describe this advantage of connection as "who you know has a significant impact on what you come to know" (p. 2). From here, we can identify the logical underpinning of social network analysis as the empirical study of connections between individuals within communities.

Social network analysis uses several techniques to empirically identify underlying patterns of social structure. It then compares these individual patterns with their influence on specific network behavior variables and performance outcomes. From a knowledge management perspective, social network analysis helps us identify basic network properties, positions of network members, characteristics of relations, cohesive sub-groups, and bottlenecks of knowledge flows. By point-

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