Chapter 5.4
Social Network Analysis

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INTRODUCTION

In knowledge management (KM), one perspective is that knowledge resides in individuals who interact in groups. Concepts as communities-of-practice, knowledge networks, and "encultured knowledge" as the outcome of shared sense-making (Blackler, 1995) are built upon this perspective. Social network analysis focuses on the patterns of people's interactions. This adds to KM theory a dimension that considers the effects of social structure on for example, knowledge creation, retention and dissemination. This article provides a short overview of consequences of social network structure on knowledge processes and explores how the insights generated by social network analysis are valuable to KM as diagnostic elements for drafting KM interventions. Relevance is apparent for management areas such as R&D alliances, product development, project management, and so forth.

BACKGROUND

Social network analysis (SNA) offers a combination of concepts, formal (mathematical) language, statistical, and other methods of analysis for unraveling properties of social networks. Social networks have two building blocks: nodes and ties among the nodes. Nodes may represent people, groups, organizations, and so forth, while the ties represent different types of relationships for example communication flows, collaboration, friendships, and/or trust. As illustration, Figures 1a and 1b represent graphs of the business and marriage network of Florentine families in 15th century (see Padgett & Ansell, 1993). The graphs are created with Netdraw (Borgatti, 2002).

SNA has its origins in the early decades of the 20th century. It draws on insights from a variety of disciplines, most notably social psychology, structural anthropology, sociology, and particularly the sociometric traditions (Scott, 2000). The formal

Figure 1a. Florentine families business network

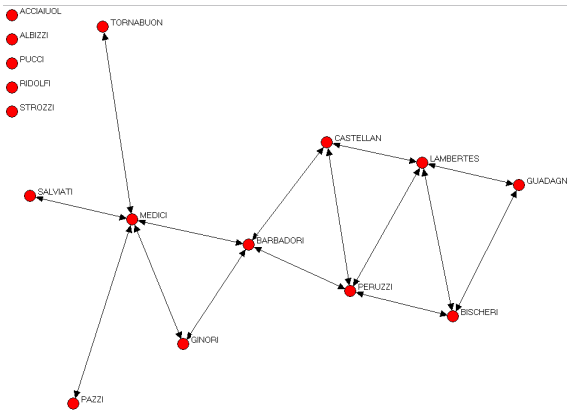
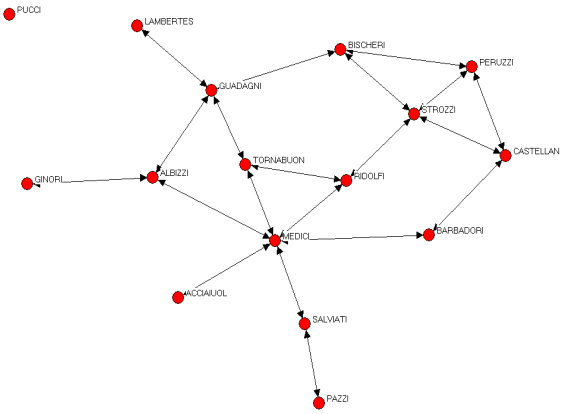


Figure 1b. Florentine families marriage network



language of SNA is based in the mathematical branch of graph-theory (e.g., Harary, Norman, & Cartwright, 1965).

Network statistics describe characteristics of a network and include network size, density, centrality, and so forth. Social network thinking has produced many such statistics (see Wasserman & Faust, 1994). However, only a limited number have been studied and have known consequences for knowledge management. To analyze and characterize networks, SNA provides statistics of the whole network, groups within the network, individuals, and relationships. The substantive meaning of these statistics often depends on the contents of the ties in the network.

Granovetter's (1973) seminal paper, titled "The Strength of Weak Ties," heralds the central place of social networks in knowledge management and shows the importance of relationship characteristics for knowledge transfer. Others show that social relationships and structures also are important for other knowledge processes, such as creation and retention (e.g., Burt, 2004; Hansen, 2002; Hargadon & Sutton, 1997; Reagans & McEvily, 2003). Granovetter's (1973) title may be a bit misleading. It suggests that "weak ties" will help individuals to get unique beneficial information. However, the paper demonstrates that it is the quality of "bridging ties" that brings this advantage. Bridging ties are relationships in a network that, when they would be removed, would leave the network in two unconnected components. These relationships are often weak in the sense that contacts are less frequent and affect is low. However, as Burt (1992) points out, this is a mere correlation. "Strong bridging ties" would offer the same or even more advantages than weak bridging ties. The advantage of bridging ties Granovetter refers to lies in the structure of all relationships, not the strength of the relationship.

This leads us to focus here on the structural characteristics of networks and their impact on KM goals. This allows tapping into accumulating insights in the KM domain generated by SNA applications. Several recent studies in network literature focus on the (contingent) effects of such dyadic qualities as tie strength, level of trust, and power on knowledge transfer and retention (e.g.,