Network Evolution and Strategy Development: A Multilevel Social Network Analysis of National Football League Coaches

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The movement of people through hiring processes represents a flow of knowledge between organizations--knowledge that incorporates both explicit and tacit dimensions. Within a system of organizations (such as research universities, high-technology companies, or sports organizations affiliated with an organized league) the movement of people creates fluid and shifting networks. Organizations accumulate portfolios of expertise as they recruit people from around the industry in which they are located, and these network portfolios can help determine organizational performance (Ozcan & Eisenhardt, 2009). In addition, individuals forge connections with each other through joint employment in the same organizations whereas organizations forge connections with each other through the exchange of personnel (cf. Breiger, 1974). In the NFL, the emergence of these multilevel industry networks are often informally traced through the construction of "coaching trees," which are based on the movement of coaches throughout the league via hiring, firing, and promotion processes (Fast & Jensen, 2006).

Managers occupying formal leadership positions in organizations (in this case, coaches) can draw upon their own interpersonal networks in order to gain access to industry resources and timely knowledge. Similarly, organizations that are more centrally located in the personnel flow network may have access to a range of knowledge sources. Further, the historical development of the entire industry network itself--in terms of its established strategic organization (cf. Hambrick, 1982; Spender, 1989)--can affect the importance of individual brokers (either at the person or firm level) in terms of gaining knowledge advantages. In sectors characterized by intense competition, gaining access to the distinctive strategies and routines of the opposition is often believed to provide a valuable competitive edge. However, gaining access to the strategic thinking and implementation of the competition requires more than observing the surface behaviors during competitive interaction. For example, no matter how much coaches understand about specific plays employed during actual games, they still may not understand the deeper level strategic thinking and the myriad routines necessary to implement that thinking. To the extent that rules and routines constitute the core competence of the organization (Nelson & Winter, 1982), reconstituting these routines within the original organization each day requires considerable knowledge and effort (Hannan & Freeman, 1984). Although surface manifestations of routines can be copied and changed, the distinctive competencies that characterize leading organizations may be much more difficult to imitate (Barney, 1991). The implementation of strategic knowledge thus requires a long-term familiarity with its nuances through relatively strong personal ties between coaches (cf. Hansen, 1999). In the case of the NFL, these ties are forged through common employment with teams using particular strategies in the early stages of a coach's career.

Consequently, this analysis emphasizes the role of the "shadow of the past" (Soda, Usai, & Zaheer, 2004) in measuring the impact of prior relationships within the co-working employment network, historic ties to organizations and coaches (ghost ties), and traditional strategies on contemporary organizational outcomes. The past shadows individuals by shaping their reputations and perceived competencies long after they have completed their professional training. This is important because one key means of strategic knowledge transfer is the hiring of knowledgeable personnel who have served in organizations in which the specific knowledge was created and implemented. In the NFL, coaches such as Bill Walsh (San Francisco 49ers) and Don Coryell (San Diego Chargers) established distinctive schools of strategy that significantly enhanced the efficiency and human capital of their respective teams (Braig, 2008). In many cases, coaches trained within these NFL teams went on to coach other teams in the league. Coaches carry throughout their careers the distinctive identity and technical knowledge that they have gained by working apprentice-fashion with master tacticians. The questions we raise concern how people within an industry of competing firms come to establish themselves as central brokers in the personnel exchange network and how organizations themselves become central players within a bounded industrial sector. The purpose of this research, therefore, is to use a social network lens to examine the evolution of current strategies within the NFL over time, to trace their growth and dissemination through the movement of coaches within the industry, and to examine
the consequent impact of this evolution on both coach-level (e.g., ascension to head coaching position) and team-level (e.g., winning Super Bowl) outcomes.

This analysis focuses on the population of all NFL coaches during the period between 1995 and 2009. The sampling period was determined through an examination of the industry’s structural changes over the course of its history. Individual employment histories were compiled for each coach in order to trace the dynamic formation and evolution of the current network of coaching ties. These histories were compiled through archival analysis of the yearly Official NFL Record & Fact Book for each season between 1995-2009, and dynamic year-by-year actor-level relationship matrices were subsequently used to calculate yearly actor-level social network analysis measures such as centrality and brokerage. During the same period (1995-2009), performance-related and network-based data were collected for all 32 NFL franchises. The analyses were based on the year-by-year personnel flow for each team, both in terms of quantities of coaches (within the network) joining/leaving teams and the evolution of interconnectedness pertaining to the specific relationships that have developed through this personnel turnover. Dynamic year-by-year team-level relationship matrices were used to calculate yearly social network analysis measures.

The analysis of the data was conducted through Siena, an emergent social network statistical software package specifically designed to analyze “stochastic actor-based models for network dynamics, which are a type of models that have the purpose to represent network dynamics on the basis of observed longitudinal data” (Snijders, van de Bunt, & Steglich, 2009, p. 2). Following the calculation of social network analysis measures such as centrality and brokerage indices, traditional inferential statistics were employed to analyze the multiple levels of data. In accordance with Powell, Koput, and Smith-Doerr’s (1996) work on networks of learning in the biotechnology industry, a panel regression model was utilized to test hypotheses related to knowledge transfer over the period of data collection. Preliminary results suggest the importance of coach-level affiliation with industry-leading strategic schools of thought and team-level ties (past and present) to prominent strategic innovators as key determinants for occupying central network brokerage positions, and in turn, individual and organizational success. In other words, those coaches and organizations with ties to major strategy schools emerge as more central, and more central coaches and teams achieved faster, more sustained success. Utilizing social network analysis to deconstruct the dynamic, multilevel development and dissemination of knowledge within an industry provides a compelling new framework for understanding organizational behavior with applications beyond the present context.