Chapter 17
Social Network Analysis for Processes Improvement in Teams

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ABSTRACT
There is a vast amount of literature showing the effects of social networks in different organizational settings, such as innovation, knowledge transfer, leadership, and organizational culture. Recently, business process literature has recognized the impact of Social Network Analysis (SNA) in process improvement by observing the real collaborative relationships between employees, or the SNA impact in detecting communication structures in a large software team. However, little is known about how the teams’ network structures may impact on the teams’ productivity. This chapter analyzes different network properties that may have an impact on the teams’ productivity and generates knowledge that may help to improve processes in the organizations.

1. INTRODUCTION
Knowledge creation is an important task for organizations (Tsai & Wu, 2010). An important research stream for the knowledge management area is the study of social network structures because they may have important implications for organizational performance (Argote & McEv-ily et al., 2003). Knowledge creation requires abilities and capacities from different actors; the interaction and communication between different actors becomes a key determinant for knowledge production (Gulati & Gargiulo, 1999; Moenaert, Caeldries, Lievens, & Wauters, 2000).

From the social network perspective it is possible to explain variance in such traditional organizational outcomes as innovation, productivity, quality and different performance indicators...
(Brass, Galaskiewicz, Greve, & Tsai, 2004). Network research perspective is distinctive from other research streams because it focuses on relations among actors. According to the social network literature, actors are embedded within networks of interconnected relationships that provide opportunities and constraints on behaviors (Brass & Galaskiewicz et al., 2004). Social Network research focuses on how the structural properties of social networks may explain organizational outcomes (Sparrowe, Liden, Wayne, & Kraimer, 2001).

There is a general consensus among social networks research academics that networks are important; however, the effect of network properties over performance is still unclear (Ahuja, 2000). Recent research proposes to focus on team level research, because teams are the nearest organizational structure for knowledge creation (Cummings & Cross, 2003; Cross, Ehrlich, Dawson, & Helferich, 2008). According to Kratzen (2001), current research "fails to offer a set of criteria for deciding whether the existing networks need to improve, what kinds of relational structure are desirable or undesirable, and what an improved network would look like." Some research supports the proposition that a high level of team communication benefits performance; however the relationship between communication frequency and team performance is not clear (Kratzen, 2001).

In the business process literature some researchers are recognizing the impact of Social Network Analysis in processes improvement. For example, the research of Bush and Fettke (2011) examine with the social network methodology the true working relationships between different employees of an organization. Their study case is exploratory and they conclude that the intersection between social network analysis research and business process literature may be important for business process improvements. The work of Wolf, Schroter, Damian, Panjer and Nguyen (2009) is another example of the importance of detecting the real working relationships between employees because this may impact the flow of communication and, as a consequence, the business processes. Wolf et al. focused on detecting communication structures between a large distributed software team and found that the quality of software projects depends on the quality of team members’ communication and relationships. However, in the literature review an important gap that is addressed in the present paper was observed: prior research recognized the importance of network relationships between teams or organizational employees; there is a consensus that social networks may have a positive impact on team performance, but little is known about how teams’ network structures may affect its performance. Our main objective is to review the social network research literature and identify key network properties that can affect organizational processes and performance.

In this paper, it is assumed that some organizations develop collaboration strategies between their employees, and these strategies build the team collaboration network structure. The principal hypothesis of this paper is that different strategies may impact differently on the organizational processes, and organizational performance. Recent research stresses the importance of analyzing internal and external team networks (Ancona, 1990; Reagans & Zuckerman, 2001; Oh, Labianca, & Chung, 2006) because both may have implications for flow communication impact (Moenaert & Caeldries et al., 2000). In Oh et al., (see Figure 1), the researchers take into account both the team internal network to examine how teams handle relationships and internal resources as well as the team external network in order to have a broader view of the availability of team resources through their external contacts. Oh et al. propose three different team network structure configurations and consider density, centrality, network efficiency and size among other variables (Oh & Labianca et al., 2006).

In Figure 1 Oh et al. consider that the optimal team network structure is the second diagram, because within the team there is a moderate relationship between team members, but outside the