

# Chapter 1.10

## Social Networks in Information Systems: Tools and Services

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### ABSTRACT

A social network represents a set of social entities that interact through relationships like friendship, co-working, or information exchange. Social Network Analysis studies the patterns of relationships among social entities and can be used to understand and improve group processes. The arrival of new communication tools and networking platforms, especially the Web 2.0 Social Networking Services, opened new opportunities to explore the power of social networks inside and outside organizations. This chapter surveys the basic concepts of social networks methods, approaches, tools, and services. In particular, this chapter analyzes state-of-the-art social networks,

explaining how useful Social Network Analysis can be in different contexts and how social networks can be represented, extracted, and analyzed in information systems.

### INTRODUCTION

The notion of a social network and the methods of social network analysis (SNA) have attracted considerable interest and curiosity from the social and behavioral science communities in recent decades (Wasserman and Faust 1994). Social Network Analysis (SNA) has been used as a powerful tool in organizations to understand the connections and influences both inside and outside the organization as well as how these connections affect the performance of core processes.

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A social network is generally defined as a set(s) of actors and the relationship(s) defined among them. Actors, also defined as social entities, can be individual or collective social units that are connected by links. Links constituting a social network may be directed or undirected, but they can be categorized as confirmed or unconfirmed based on the confirmation of the relationship by both actors (Cross and Parker 2004). The relationships between actors can be also classified based on cardinality: a dyad is a linkage or relationship between two actors and a triad involves a triple of actors and associated ties.

In structural terms, there are different kinds of social networks: one-mode networks study just a single set of actors, whereas two-mode networks focus on sets of actors and one set of events. Dyadic networks and affiliation networks are examples of two-mode networks (Wasserman and Faust 1994). An ego-centered network is an example of a one-mode network and consists of a local actor (termed ego), a set of alters who have ties to ego, and measurements of the ties among these alters (Wasserman and Faust 1994). Subsets or subgroups can be identified and studied separately in the network. A clique designates a subset of a network in which the actors are more closely tied to one another than they are to other members of the network (Jamali and Abolhassani 2006).

Both social actors and links may have additional attributes that express additional information about them. Such attributes include the relationship role played by the entity (Masolo, Vieu et al. 2004), more information about the entity, or the relationship between nodes.

The introduction of computational methods opened new opportunities for the use of social networks by allowing the analysis of larger datasets. This analysis facilitates the addition of social networks as well as their automatic extraction from existing information repositories.

Web 2.0 popularized the concept of the semantic web. Several social communities permitting users to connect and share information and

knowledge with their friends or the whole community appeared.

This chapter presents the tools and methods for correctly extracting a social network and representing it in a form that can be later analyzed. After that, different software tools for performing SNA are analyzed. With regard to the organizational context, the Web 2.0 social networking services phenomenon is developed. Several examples of known worldwide platforms are presented and compared, and we show how organizations are using these tools to improve connections and knowledge sharing inside organizations. We discuss also our vision about what the future can bring to this field with the integration of different platforms and methodologies. Finally, we present SNARE (Social Networking Analysis and Reengineering Environment), a system we are currently developing that proposes to integrate Organization Network Analysis and Social Networking Services with different approaches and techniques. We conclude with our vision of the major concerns in these topics and how they are related to the general topic of the book.

## **BACKGROUND**

Social Network Analysis represents a method for achieving analytical results about almost any group interaction in which social entities are present. This section introduces SNA and its most common measures and explains its use in the organizational context.

### **Social Network Analysis**

The roots of SNA techniques were affected by three main influences beginning in 1930s. The most notable influence was Jacob Moreno, who investigated how an individual's group relationships affected his own actions and development. Moreno was credited of devising a sociogram as a way to depict such social relationships (Fred-

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