Chapter XIII

Computer-Supported Social Networking Based on E-mail Exchange

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ABSTRACT

The exploration of social networks is essential to find capable cooperators who can help problem-solving and to augment cooperation between workers in an organization. This chapter describes PeCo-Mediator-II to seek for capable cooperators with the chain of personal connections (PeCo) in a networked organization. Moreover, this system helps gathering, exploring and visualizing social networks in an organization. The experimental results show that the system facilitates users encounter cooperators and develop a new helpful relationship with the cooperators.

INTRODUCTION

Recently, opportunities for communication and collaboration via computer networks have immensely been increased in networked organizations (Sproull and Kiesler, 1991). A fundamental problem is how to encounter people who can help problem-solving. We are focusing on the problem of discovering such people through social networks. Social networks are at least as important as the official organizational structures for tasks ranging from immediate, local problem-solving (e.g., fixing a piece of equipment), to primary work functions, such as creating collaborative groups (Kautz et al., 1997a).

In CSCW, researchers are interested in the role of social networks between organizational members. Clement stated that users developed informal collaborative networks to know how to use a new software (Clement, 1990). Then, private networks are important for workers to solve problems by providing helpful information. A number of studies have shown that one of the most effective channels for gathering information and expertise within an organization is its informal networks of collaborators, colleagues and friends. The networks of helping relationships are called Help Network (Eveland et al., 1994). However, the networks are not collected and generally follow work group alignments rather than
technical specialization. Therefore, it is significant to use members’ interpersonal connections effectively in their activities.

Our research focuses on “Personal Connection” (PeCo) which is a starting point for finding a capable cooperator. We propose PeCo-Mediator-II (Ogata et al., 1996a, Ogata et al., 1997) for gathering, seeking, and visualizing social networks in a networked organization. PeCo-Mediator-II is a distributed system with a personal database (PeCo-Collector) and a software agent (PeCo-Agent). Every user has the two softwares on the respective site. PeCo-Collector incrementally gathers information on its user’s acquaintances and the relationships through watching the exchanges of e-mail. PeCo-Agent moves to colleagues’ sites and negotiates with other agents and users to find cooperators. Although the users of both NetNews and mail lists are often passive to find answers, our system can actively discover cooperators with the chain of personal connection from the user and the cooperators.

**OVERVIEW OF PECO-MEDIATOR-II**

When a computer network connects people or organizations, it is an on-line social network. Just as a computer network is a set of machines connected by a set of cables, a social network is a set of people connected by a set of social relationships, such as friendship, co-working, or information exchange (Garton et al., 1997). Computer-Mediated Communication (CMC) systems also reduce the transaction costs of initiating and maintaining interpersonal ties (Pickering and King, 1992). Weak ties created by CMC expand the channels of information sources for the individual and have potential for strong ties.

Social network analysis is focused on uncovering the patterning of people’s interaction (Scott, 1992, Wasserman and Faust, 1994, Wellman and Berkowitz, 1997, Hiramatsu, 1990, Yasuda, 1997). Network analysis is based on the intuitive notion that these patterns are important features of the lives of the individuals who display them. Network analysts believe that how an individual lives depends in large part on how that individual is tied into the larger web of social connections. Many believe, moreover, that the success or failure of societies and organizations often depends on the patterning of their internal structure. Typically social networks are obtained in two ways: socio-centric and ego-centric approach. First, socio-centric approach considers a whole network based on some specific criterion of population boundaries such as a formal organization. A whole network describes the ties that all members of a population maintain with all others in that group. Although this method is available for handling incomplete data sets, this requirement places limits on the size of networks that can be examined. Second, the ego-centric approach considers the relations reported by a local individual. This approach is particularly useful when the population is large.

Our initial system called PeCo-Mediator (Ogata et al., 1995) was based on socio-centric approach. PeCo-Mediator is a groupware system that allows sharing of PeCo in a group and to search for connections between the user and targets. The users need to share PeCo with the common database of PeCo-Mediator. Although the system was very available in some small groups, it was reluctant in terms of users offering their private information like PeCo into the common database.

In this chapter, our target is a large-scale organization. Therefore, PeCo-Mediator-II gathers PeCo based on ego-centric approach. PeCo-Mediator-II consists of the two systems, PeCo-Collector and PeCo-Agent (see Figure 1). Every organizational member has the two softwares on the respective site. PeCo-Collector gathers information on its user’s acquaintances and the relationships through watching the exchanges of e-mail.
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