Identifying Knowledge Flows in Communities of Practice

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INTRODUCTION

Knowledge sharing is a collective process where the people involved collaborate with others in order to learn from them (Huysman & de Wit, 2000). This kind of collaboration creates groups of people with common interest called communities of practice where each member contributes knowledge about a common domain (Wenger, 1998).

Communities of practice enable its members to benefit from the knowledge of each other (Fontaine & Millen, 2004). To achieve this, different techniques and technologies can be used, such as shared documentation, groupware tools, lessons learned systems, and so forth. Therefore, to increase and improve knowledge sharing in communities of practice, it is important to study the mechanisms used by a particular community and understand how the knowledge flows through its members (Guizzardi, Perini & Dignum, 2003).

This article presents a qualitative approach for studying and understanding how knowledge flows in communities of practice within organizations. The goal is to provide a methodological guide for obtaining useful information for the development of knowledge management tools for supporting *knowledge flows* in these communities.

The content of the article is organized as follows. First the importance of supporting *knowledge flows* in communities of practice is highlighted. Then, a qualitative methodology for identifying *knowledge flows* in communities of practice is described, followed by some examples from a study conducted in the field of software maintenance. Finally, we present our conclusions of this work and future research.

MAIN BODY: KNOWLEDGE FLOWS IN COMMUNITIES OF PRACTICE

In a knowledge-intensive organization, employees constantly have to deal with a changing environment where knowledge is crucial to make decisions and adapt to these changes. To obtain the required knowledge for making those decisions, employees generate communities where each member collaborates with the others sharing knowledge about a common domain. On the other hand, to facilitate their adaptation, the organization's processes must become dynamic, that is, they must be designed to change based on the knowledge involved and on the activities performed by the members of the organization. Knowledge management (KM) can help address this issue, since it provides methods, techniques, and tools for facilitating organizations to become adaptable to these changing environments (Davenport & Prusak, 2000; Tiwana, 2000).

One of the main objectives of KM is to make available the appropriate knowledge, in the right place, at the right moment, to whoever needs it; therefore the flow of knowledge is very important

for managing the knowledge of an organization (Nissen & Levitt, 2002). In fact, it has been considered the central component of a KM system (Borghoff & Pareschi, 1998). Communities of practice stimulate this flow of knowledge through organizations, since knowledge flows easily in these communities because they enable face-to-face interaction between their members (Brown, 2002; Fontaine & Millen, 2004). Even though direct interaction between members of the community is very important for sharing their tacit knowledge, other kinds of knowledge transfer must be considered such as documents sharing. Hence, provision of mechanisms that facilitate, increment, and improve the transfers of both tacit and explicit knowledge into communities of practice it is required. Therefore, *knowledge flow* must be one of the most important issues for supporting KM in these communities, since the goal is that the knowledge of each member can be used by the others (Borghoff & Pareschi, 1998; Guizzardi et al., 2003).

To provide support to the *knowledge flow* of a community, it is important to identify specific issues of the dynamics of *knowledge flows* in the processes and activities performed by the members of that community, as well as the social, cultural, and technological aspects which can affect those flows, in order to provide useful insights for the definition of requirements for designing KM systems that support the flow of knowledge in the community (Rodríguez, Martínez, Favela, Vizcaíno & Piattini, 2004a). A process modeling approach, as used in business processes reengineering (Curtis, Kellner & Over, 1992), can be appropriate for this purpose, since it provides techniques for analyzing technological and social aspects in organizations, as well as for modeling the dynamics of their processes. Once identified and understood how the knowledge flows through the community and which are the main elements that affect that flow, other approaches can be used for implementing the support systems—for example, an agent-oriented approach such as the proposed by Guizzardi et al. (2003, 2004).

In the following section we present a qualitative methodology for identifying *knowledge flows* in communities of practice; this is a methodology that we have defined and followed to obtain requirements for the design of a KM support system for a software maintenance group.

KOFI: A METHODOLOGY FOR KNOWLEDGE FLOWS IDENTIFICATION

To design and develop support systems, such as for KM, for communities of practice, it is important to consider the contextual issues of the customers or those who will use the system (Beyer & Holtzblatt, 1998). We think *knowledge flow* must be a central aspect for supporting communities of practice; therefore, to understand the context of those communities, it is important to understand which kinds of knowledge are important for the community, which knowledge sources they share and how to obtain that knowledge, which mechanisms they use to consult the sources, and how all of these interact in the processes and activities performed by the members of the community—in general, how the knowledge flows through the community (Rodríguez et al., 2004a). To obtain answers for these questions, we have defined a qualitative methodology to guide the process of identifying how knowledge flows in a community of practice, and how to provide support to facilitate, increment, and improve the flow of knowledge in the community by identifying the problems that affect that flow.

THE METHODOLOGY

The methodology is composed of four stages, as shown in Figure 1. In stage one the main sources of knowledge and information are identified and classified (documents and people); then, in stage two, the knowledge contained in those sources is also defined and classified; in the third stage the main processes and activities performed by the members of the community are modeled to identify the people involved, how they collaborate to complete their tasks, and how the knowledge and sources interact in those activities; finally, in stage four the main problems that can affect the flow of knowledge are highlighted through the definition of scenarios. The process proposed to carry out the above stages is iterative, since each stage could generate information to complement the others. For example, if we identify a new kind of knowledge source while we are modeling flows of knowledge, we can add the source