

Chapter 10

Implicit Culture Framework for Behavior Transfer

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ABSTRACT

People belong to different communities: business communities, Web 2.0 communities, just to name a few. In this chapter the authors show that experience acquired by people in communities constitute community culture. The authors introduce the problem of culture transfer between or within communities and propose a domain-independent approach for transferring community culture. First, the authors formalize the notion of culture, which includes behavior, knowledge, artifacts, best practices, etc. Second, using this formalism, the authors propose the Implicit Culture Framework, which is an agent-based framework for transferring behavior between community members or between communities. Finally, the authors present and evaluate a system for web service discovery developed using the Implicit Culture Framework.

INTRODUCTION

In different areas of their lives, people form and become part of different communities. Examples include, but are not limited to business communities, hobby communities, Web 2.0 communities (e.g., in Flickr, Delicious, CiteULike, Bibsonomy), and communities of software users (e.g., BitTorrent, Firefox, OpenOffice). Such communities are often called communities of practice and are

defined as “... groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” (Wenger, 2009). People in a community of practice interact and develop shared competence and experience related to their activity (Wenger, 1999). The accumulated experience is probably the most important result of the community interactions and it comes in the form of behavior, best practices (Shaw & Gaines, 1999), ways of using community artifacts (Lave & Wenger, 1991) and addressing recurring problems (Wenger, 2009), and implicit or explicit

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knowledge (Baumard, 1999; Nonaka & Takeuchi, 1995). In other words, we can speak about the culture developed by a community.

Information about the culture can be used for improving the state of affairs of the community, e.g. by providing economic and social benefits to community members. For example, we can use the culture to facilitate the integration of newcomers into the community; to transfer and share knowledge, behavior and experience within or between communities; to discover and characterize communities.

However, a substantial part of the community culture is implicit, i.e. not readily available to all community members, even though sometimes accessible by single individuals. Still, in many cases the culture should be preserved even if the community changes. Thus, the problem of dealing with culture of communities can be formulated in terms of discovering, representing, transferring, and preserving culture. Instances of this problem are described in the literature as transfer of knowledge and retention of experience in organizations (Bender & Fish, 2001), leveraging company's knowledge (Nonaka & Takeuchi, 1995), sharing implicit knowledge in communities of practice (Gongla & Rizzuto, 2001; Mimmagh & Murphy, 2004).

Different approaches address some aspects of the above-mentioned problem. Nonaka and Takeuchi (1995) highlight the importance of knowledge for the organizations and propose a theoretical framework for knowledge creation. The framework implements the resource-based approach and describes elements of knowledge creation and their interactions that lead to creating new knowledge. Another approach is legitimate peripheral participation, i.e. actively involving newcomers into social practices of communities. It is proposed by Lave and Wenger (1991) as an approach that facilitates acquiring of existing socio-cultural practices by new community members. In computer science, examples include recommending friends and communities in Facebook and LinkedIn, using forums,

blogs, FAQ lists. There are also social navigation systems that help communities to share their experience in web search (Smyth et al., 2005), in using educational resources (Brusilovsky et al., 2005, Farzan & Brusilovsky, 2007), etc.

We argue that a more systematic computer science approach that includes engineering aspects is required to capture, represent, make explicit, and transfer elements of culture. As a result, communities will get more economic and social benefits from the use of their culture.

In order to propose such an approach, we first formalize the notion of a community culture and define it as a set of traits that are shared by the community and are transmitted. The transmission dimension points to a way of spreading culture. The sharing dimension is required for two reasons: (1) to go from the set of personal traits of an individual to the culture of a community, and (2) to filter out traits which only pertain to the community as a whole, but not to individuals. Examples of latter traits include marriage habits and birth rate.

Second, we focus on behavior as an important aspect of culture and propose the Implicit Culture Framework, an agent-based framework for transferring behavior between community members or between communities.

Finally, we show how to apply the proposed solution in the domain of recommendation systems using a system for web service discovery as a case study.

The objective of this chapter is to consolidate the effort and present a complete overview of the Implicit Culture Framework. More specific objectives are: to propose a definition of a community culture, to propose an engineering approach, the Implicit Culture Framework, for discovering, representing, transferring, and preserving community culture, and to show how to apply this approach in practice. With respect to the book's focus on culture-aware information technology, this chapter describes a framework for modeling and transferring culture in social software.

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