

An Awareness Framework for Divergent Knowledge Communities

Farhad Daneshgar

University of New South Wales, Australia

Gerome Canal

LORIA – Nancy-Université, France

Alicia Diaz

UNLP, Argentina

INTRODUCTION

The Internet-based knowledge communities are considered today's main method for knowledge sharing in virtual communities. Zigurus and Qureshi (2001) suggest that collaborative systems and Web technologies have opened up myriad of possibilities for creating new and different types of relationships as well as increasing the reach of these relationships. On the other hand, knowledge logistics in Internet-enabled collaborative environments (i.e., who does what, how, using which resources, etc.) require novel conceptual abstractions and revised metaphors for collaboration and coordination as well as novel technological solutions, which go well beyond current collaborative software systems (Dustdar, 2004). From a technological perspective, the Web-based knowledge communities are special kind of today's Discussion Forums that are considered as today's main method for knowledge sharing in many virtual environments. These systems have their roots in the traditional structured messaging systems of the late 1980s initiated by researchers in the field of Computer-Supported Cooperative Work (CSCW). These platforms were designed to facilitate communication among remote participants at same/different times (Borenstein & Thyberg, 1993; Malone, Grant, Lai, Rao, & Rosenblit, 1993). The groupware technologies that support discussion forums are mainly Internet Web sites that use the Internet technology embedded within HTML. Like the newsgroups, discussion thread systems provide support for discussions and organize them according to topic and subtopic where users can participate. Unlike the newsgroups however, their services are not normally catalogued as part of the public Usenet service on the Internet, and therefore the Usenet search engine does not search what is written in a forum, although more

recent versions of these systems that support articulation of knowledge may use specialised protocols in order to provide their members with certain level of storage and search facilities.

With the recent growing body of literature on knowledge management and e-collaboration, much attention is now being given to creation of many novel conceptual/technological frameworks for managing knowledge creation in various kinds of e-communities. This article represents one such attempt with particular attention given to the *divergence occurrences* in knowledge communities, and their management as will be discussed later. A recent study by Diaz and Canals (2004) demonstrated that as the degree of people's involvement in various communications acts increases, so will the opportunities for divergence. Contrary to the general tendency within the CSCW community that regards conflicts as a synchronization and versioning problem in need of some solutions, the knowledge management community tends to live peacefully with such divergences and regards them as opportunities for interaction and therefore, sources of creating new knowledge.

BACKGROUND

A study by Diaz and Canals (2004) states that a natural consequence of the act of sharing knowledge in virtual knowledge communities is *divergence occurrences*. They also introduce a technological method called *DIVA* for management of divergence awareness in knowledge communities. According to this framework, divergences occur until such time when the community reaches a unique perspective.

The authors of this article share similar beliefs to those of the knowledge management community in the sense that conflicts and divergencies must be treated as a natural part of the knowledge sharing process that promotes emergence of new knowledge; and as a result, any technological method that supports knowledge-sharing activities must pay attention to divergences and conflicts as well as methods for managing these divergences. This article extends both the use as well as conceptual boundaries of e-collaboration research (Kock & Nosek, 2005) by integrating conceptual boundaries of two existing frameworks in order to provide a business context for management of the current virtual knowledge communities. This is shown in more details later on in the section Analysis of the Results.

The divergence awareness (DIVA) technological framework provides a management technological platform for managing *divergence occurrences in knowledge communities*. DIVA allows divergence to coexist within the community as a source of creating new knowledge while enabling community members to contribute while moving between private and shared knowledge spaces and managing contribution threads seamlessly. The DIVA workspace system is aware of both its members' profiles (skills, interests, etc.) as well as their evolution. As a result, it can deliver custom-made contributions to the community members. Divergence occurrences can be classified into (1) generation of alternatives, (2) arguments, and (3) different point of views about a topic of interest (Ibid).

The DIVA workspace consists of a *private knowledge workspace* (PKW) and a *shared knowledge workspace* (SKW). It is believed that community members must already enjoy a high level of knowledge usage before they are able to create PKWs for organising their knowledge artifacts, possibly by using files in folder hierarchies (Dustdar, 2004).

The PKW is articulated with personal view of the shared knowledge space. In the current version of DIVA there is no formal line that separates PKW and SKW; and these two concepts remain at conceptual levels and cannot be easily operationalised. As a result of the added formalism of the proposed integrated framework however, identification of these boundaries is greatly facilitated and formalised on the basis of the semantic concepts used in the added formalism called the *awareness net*. The proposed integrated framework integrates the people and process perspectives of the awareness net with the technological perspective of the DIVA in

order to provide a solution that guides groupware design of collaborative systems in supporting divergence in knowledge communities more effectively.

THE AWARENESS NET

The awareness net is a major component of a conceptual framework called process awareness framework or PAF (Daneshgar, 1997; Ray, Shahrestani, & Daneshgar, 2005). The PAF was initially created for identification of the actors' awareness and knowledge sharing requirements in collaborative business processes. Subsequent studies revealed some additional capabilities for this framework including identification of the data modeling requirements of collaborative knowledge-based systems (Daneshgar et al., 2004), and identification of the user-interface design requirements for supporting knowledge-sharing processes (Daneshgar & van der Kwast, 2005). A summary of theoretical foundation of the awareness net is explained in the following paragraphs (adpted from Ray, Shahrestani & Daneshgar, 2005).

According to the awareness net, each actor (or, community member) is assigned one or more *roles* within the collaborative process (or, the community). Each role is associated with a set of *personal* and *collaborative tasks*. An actor can play various roles. In this study we extend the scope of knowledge sharing process from being a set of pairwise intellectual activities, as is the case for DIVA, into a larger collaborative process context where people perform various tasks and use various artifacts, as is defined by the awareness net model. The following sections demonstrate that by integrating the DIVA and awareness net frameworks the actors' knowledge-sharing requirements as well as their high-level PKW and SKW requirements can be defined more precisely. This in turn will guide groupware design for systems that support knowledge communities.

From a graphical perspective, the awareness net is a connected graph that represents a collaborative business process, in this case, the knowledge community. It consists of a set of collaborative semantic concepts and their relationships as its vertices and links respectively. When combined and linked together, these semantic concepts make up a connected graph called the awareness net that represents a collaborative process. Figure 1 shows awareness net for a typical DIVA knowledge community where members are involved in various

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