Chapter 21
Semantically Linking Virtual Communities

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ABSTRACT

A Virtual Community can be defined as a group of people sharing interests and making use of electronic forms of communication for exchanges. The shared interests might be with respect to a topic or a domain of knowledge, but it might also be related to a task. With the advent of virtual communities, there is a growing need for providing methods to link these communities together in a meaningful way. In this chapter, we shall describe the usage of semantic technologies for enhancing community portals and connecting heterogeneous virtual community sites. We propose a framework for semantically interlinked virtual communities called SIVC that can be used for information structuring, export and information dissemination. We present the SIVC ontology which combines terms from vocabularies that already exist with new terms needed to describe the relationships between concepts in the domain of virtual community.

INTRODUCTION

A Virtual Community can be a virtual enterprise, a virtual team or a social virtual community. A virtual enterprise is usually defined as a temporary or permanent alliance of organizations for the accomplishment of a task by way of information and communication technology, a virtual team is a group of people that rely primarily or exclusively on electronic forms of communication to work together in accomplishing goals (Palmer et al.,1997)] and a social virtual community is a

community of interest on the Internet. Rheingold (1993) deals with the emergence of social virtual communities. He describes Virtual Communities as "social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace". Hagel and Armstrong (1997) look at virtual communities as "Virtual Enterprises". Many social communities on the Internet are opposed to the idea of commercialization but the authors argue that once these communities realize

their full market potential they will be willing to engage in purchasing transactions.

Following Schubert (1999) we define Virtual Communities by:

Virtual Communities describe the union between individuals or organizations who share common values and interests using electronic media to communicate within a shared semantical space on a regular basis.

We propose a framework for semantically interlinked virtual communities (SIVC) that aims to interconnect virtual communities. SIVC will thus provide a way to overcome the limitations of current sites in making related pieces of information more accessible to users; by searching on one forum, the ontology and interface will allow users to find similar information on other sites that use a SIVC based system architecture.

A possible SIVC based search is illustrated by the following use case. A person is searching for information in view of the installation of a home automation system in his house. There is a post A discussing local system vendors on site 1, a forum dedicated to home automation, that references both a Usenet post B comparing various functions of a system controlling the physical environment and a mailing list post C explaining how to install home automation system. Presently the user will have to traverse at least three sites in order to find the relevant information. However, by making use of the SIVC ontology and remote RDF (Resource Description Framework) querying, he will access the necessary information through one search for the system installation on the home automation forum that also will yield the relevant text from the interlinked Usenet and mailing list posts B and C.

In this chapter, we shall describe the usage of semantic technologies for enhancing community portals and connecting heterogeneous virtual community sites. We shall overview ongoing standardization activities as well as research challenges and present an ontology for the domain of virtual communities. We shall also discuss how to combine different ontologies in architectures for community site interoperablity. Finally, we will describe some efforts towards implementing semantic technologies in virtual communities that focus on scientific collaborations.

RELATED WORK

The Harvest (Bowman, 1995) is an early system that can be used to gather information from diverse repositories to build, search, and replicate indexes, and to cache objects as they are retrieved across the Internet. Harvest uses the Summary Object Interchange Format (SOIF) to exchange metadata about resources. In contrast, Semantically Interlinked Open Communities (SIOC) uses RDF as the exchange format and allows mappings between different vocabularies, which is not envisioned in SOIF. Issue based information systems (IBIS) model (Rittel, 1970) uses discussions in the process of solving design issues and provides a detailed model for links between conversations. SIVC uses metadata and reply links to connect conversations on online community sites and can be extended to describe discussions. Various approaches for data integration on the Web, such as data representation languages, structural information retrieval, and query processing, are surveyed in (Florescu,, 1998). However, advanced database techniques have failed so far to surface on the Web. SIVC is providing a common vocabulary for data representation across virtual communities.

RDF Site Summary (RSS 1.0) is widely used in weblog systems and news sites. RSS 1.0 defines a lightweight vocabulary for syndicating news items, but is used for all sorts of data exchange. Although RSS works well in practice, there are several issues: firstly, only the last "n" news items are typically exported in RSS. Secondly, most of the systems use non-RDF versions of RSS, which limit its use with other vocabularies.

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