Open Collaboration Agents to support Community Webs

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1. Introduction

At present, the positive use of the Internet media is increasing significantly. The website will have to become an information facilitator or a communication medium (i.e., community portal, bulletin board, community chatter, etc.). These types of website are also called community webs [1]. Although community webs provide an information infrastructure for people, they do not provide all information for which the users require. The goal of this research is to allow community webs to provide more related information by adding open collaboration agents that retrieve related information from other community webs. The paper describes feature of community webs, design and implementation of open collaboration agents, and the result of preliminary experiments.

2. Community Webs

The term "community webs" in this paper refers to the websites that provide communication medium for the communities such as community portal, bulletin board, mailing list, community chatter, etc. Each community shares some identified and formalized knowledge. More precisely, a community using community webs is a group of people sharing a domain of discourse, a set of information resources, and having some common interests. The important feature of a communication medium is that they can use anytime and anywhere without time spatial restrictions.

Recently, the community webs are increasing significantly such as MSN community [2], Yakushite Net [3], and eBay [4]. Many of them are try to provide new feature to support member in their communities such as community portal, web translator, bulletin board system, etc. This paper, the layout of target community webs are community web that have the summary of topics (it covers the interested subject or object of a community), related communities (the community webs relevant to the subject or object), and communications log (the contents in the bulletin board). Generally, the bulletin board is the place that contains idea, interest and discussion of user in website. Agent can learn what now users are interest by learning from contents in bulletin board. The purpose of topics is to group contents in bulletin board into the summary of topic and to provide links to another community that related to that topic. The detail to summary topic in bulletin board or clustering context already discussed in another paper such as multiple-text summarization [5]. The paper focuses on “How to find related communities without help of search engines?” that are discussion in section below. The sample of a page of a target community web is shown in Fig. 1.

Fig. 1 An example page of a community web

3. Open Collaboration Agents

In this section, we give an answer to the question “How to find related communities without help of search engines?” The section above community web’s agent find and provide related links for user to find more information at other community by using concept of distributed artificial intelligence. In this paper, OCA (Open Collaborative Agents) refers to the distributed agents model, which allows agents of different community (have their own thinking or own decision algorithm) written in different programming languages and formats to cooperate or communicate together without the need of reprogramming with common agent communication language and protocol. The following OCA discussed into two parts. First is communication model between agents. Second is making it distributed.

The communication model of OCA composed of two main parts that is communication language and communication protocol as shown in Fig. 2. Agents communicate with others by using communication language over communication protocol. OCA uses XML for communication language and email for communication protocol. Communication protocol combines with interaction protocol and transport protocol. Interaction protocol is a high-level framework for interaction (registration, request, reply, etc.). Transport protocol is the actual transport mechanism used for the communication (POP3, IMAP4, SMTP, HTTP, etc.).

Fig. 2 Communication model of OCA

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The interaction protocol of OCA is divided into five parts.

**Registration** An agent request registration by sending its email address

**Information request** The agent (requester) that needs information will send a request for information.

**Information reply** The agents that receive a request and decide to reply will reply its URL along with the information back directly to the requester.

**Update request** After received the replied information, the agent (requester) will have to check the freshness of the information by sending the update request directly to the supplied agent.

**Update reply** Once the information is updated and a request update has been received, the agent will send acknowledge of the updating of information to the request agent.

These tasks is to distribute, broker agent is used intends to broadcast the information request and manage the email from registration. Therefore, OCA find related links by send message in form of XML as communication language using interaction protocol from above and broker agent to broadcast. The overview of interaction of OCA is shown in Fig. 3.

5. **Relate works**

Many types of distributed system have been implemented such as OAA [7], CORBA, and Mobile agent. All of them are essentially designed to find a goal by using distributed model. Although the OAA is using the same concept but the purpose are differ. For communication language compare with KQML [8], the key distinction is that XML is easy to extend. In view of information retriever, compare with MARS [9], MARS retrieve information by send query to specific agents. The key distinction is that OCA send request to Broker agent. This means the requester is not required to give the specification of who is to do the work or how it should be performed.

6. **Conclusions**

In this paper, we have presented the design, and implementation of OCA. This work was motivated by the difficulty to find links without using search engines. The OCA is used for distributed information retrieval by following this motivates. However, OCA can adapt to another application such as shopper agent.

7. **Reference**

1. Community Web  [http://citeseer.nj.nerc.com/christophides00-community.html](http://citeseer.nj.nerc.com/christophides00-community.html)
3. Example (Yakushite Net)  [http://www.yakushite.net/index.html](http://www.yakushite.net/index.html)
4. Example (eBay) [http://pages.ebay.com/](http://pages.ebay.com/)
6. Procmail [http://userpages.umbc.edu/~ian/procmail.html#intro](http://userpages.umbc.edu/~ian/procmail.html#intro)