Communication in WebBeholder Agent Community

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1 Introduction

Browsing through the sites for new updates is not only time consuming task but also vain in case that there is no change made on the sites once visited. We need some representatives to do such a burdensome and tedious jobs for us. Furthermore, we would like to know *when* the changes occured and *how* they look. That means not only tracking tools but notification and presentation issues are also taken into account.

The WebBeholder is a cooperative agent community framework that provides open services on finding and displaying changes on the World Wide Web. Several agents and components in the community interact with one another to achieve the goals issued by users of the system. The system consists of a service provider agent that keeps watching and detecting changes on the Web, a number of personal mobile agents that represent each user, and a number of mediators to negotiate with the service provider agent for incoming personal agents. This paper describes the framework with an emphasis on communication among agents and components within the community.

Our research proposes this agent community framework in order to establish a more flexible and efficient approach to accomplish the changes detecting and displaying goals. The system features the flexibility and efficiency of using mobile information agents in constrained environments. The changes detection services in the community is provided in the way that the users can fully customize their agents to meet individual user model rather than posting all their preferences to be served by centralized server.

2 Architecture

The environment of overall system for the WebBeholder community is shown in Fig. 1. The user of the community dispatch their own agents to the Mediator via the internet. At the Mediator site, all personal agents are bound in a provided platform which the agents can execute their codes under a restricted control. There are three service modules within the Mediator. All service modules run independently. The Request Broker is the module that negotiates with and posts the queries to the Service Provider Agent for the personal agents.
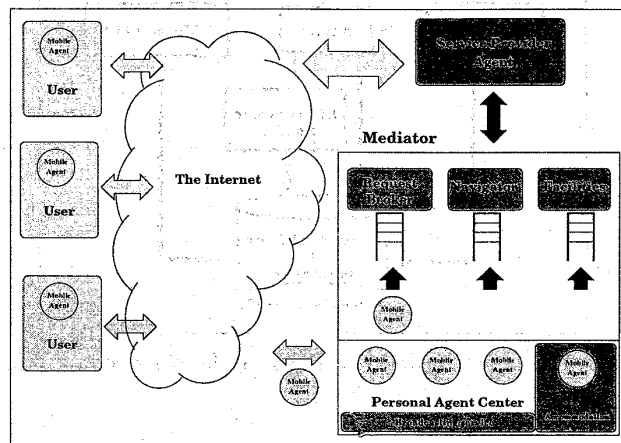
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Figure 1: *The WebBeholder Community.*

The *Navigator* module tells the personal agents about locations of other WebBeholder communities. This service is provided in the case that personal agents could not find any information on the pages assigned by their users. The personal agent can query the Navigator to look further for some communities which have the desired information.

The *Facilities* module provide facilities for incoming personal agents. Since the mobile agents in the provided platform of the Mediator site have restricted access to the Internet and resource usages, the Facilities module offers these facilities under limited operations. The details of facilities are described in the topic *Facilities in the Community*

The main agent that offer services to the community is the *Service Provider Agent*. The architecture of the service provider agent is shown in Fig. 2. Its main modules can be listed as following:

- **Agent:** It is the heart of the service provider agent. It interacts with other modules in order to retrieve and compare HTML documents.

- **Scheduler:** The scheduler will look up the pages registered for each user then make a schedule of checking for the user.

- **Difference Engine:** The agent implement the Difference Engine in order to compare the content of updated pages and see whether there are significant changes in them. The agent initials http connections via the internet and access World Wide Web sites then loads the HTML document of Web pages to the server. The old and new version of HTML documents are compared by running the Difference Engine. The results
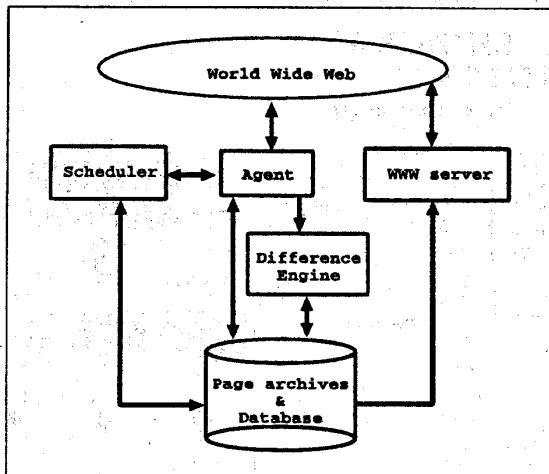
Figure 2: *The building blocks of the service provider agent.*

from Difference Engine are very important for the agent to classify the changes. At the same time, it will summarize the updated information into another HTML document by innovative algorithm proposed in this research. The agent will then evaluate the significance of the chages detected so that it will know whether the users should be notified of the changes.

- **WWW server:** The page archives contain the old and new version of Web pages together with summary pages constructed by the HTML Difference Engine. When users are notified by their personal agents, they can view the changes with their browsers via the WWW server.

3 Facilities in the Community

The facilities in the community can be listed like the following:

- **Post Office:** The personal agents may have messages for their owners when they find something interesting or just for emergency cases. The message can be sent via the post office of the community.

- **Accommodation:** This provides accommodation for some personal agents that wait for some predictable events or could not go back to its user for a while.

4 Communication in WebBeholder

When personal agents receive assignments from their users, they goes to some Mediator sites. Right in each Mediator site, there will be many personal agents. Each personal agent has capability to deal with components in the Mediator site. At the present,
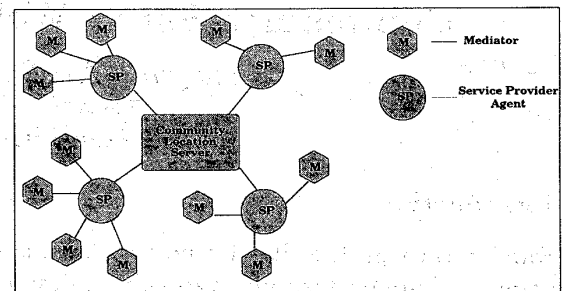

Figure 3: *The WebBeholder Communities are linked together by The Community Location Server.*

we do not allow crosstalk among personal agents. The personal agents are independent of one another.

The communication in the community can be categorized as shown below:

- **Personal Agent vs. Components:** Each personal agent knows how to deal with various components in each mediator site, such as Request Broker, Navigator, and Facilities.

- **Components vs. Service Provider Agent:** The components each Mediator site deal with the Service Provider Agent in order to carry requests gathered from various personal agent to it.

- **Service Provider Agent vs. Community Location Server:** This level provides the door to another community via the Community Location Server. The WebBeholder communities are linked together as shown in Fig. 3. The Community Location Server is the center of all communities. It holds the information about location of service provider agents, the Web pages they are responsible for, and their Mediator sites.

5 Conclusion

The WebBeholder was proposed as another approach to finding and displaying changes on the World Wide Web. The communication in the WebBeholder agent community is divided into layers in order to establish systematic flow of actions among agents and components. The cooperation among personal agents needs a good protocol and will be incorporated in next step.

References

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