

A Virtual Environment on the Web to Promote Social Interaction and Collaborative Work

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Abstract

The Collaborative Virtual Environments (CVE) support the collaboration, communication and social interaction among users in a virtual space. In this paper we show a customizable CVE implemented on top of the Web to promote the collaborative learning in university courses. Our CVE allows the creation of different interaction environments according to the users' needs. The design was focused on the *collaborative rooms* and *hall* metaphors.

Keywords: CSCW, Collaborative Virtual Environments, Web applications.

1. Introduction

The Web's nature was traditionally asynchronous. However, the recent advances make possible the development of more interesting collaborative applications on the Web, with a high synchronism degree [Gall97, Trevor97]. On the other side, the collaborative virtual environments are more flexible than the traditional CSCW environments [Takemura92].

In order to provide a CVE for the students and lecturers we implemented a prototype named "VESCL" (*Virtual Environment to Support Collaborative Learning*). VESCL supports the collaborative work and the informal social interactions.

2. Conceptual Model of the VESCL System

2.1. Metaphors

The VESCL system was designed to support the informal social interaction and the collaborative work. The informal social interaction implies to be able to know and to talk to new people. The workgroups with informal interaction tend to be more productive than the workgroups with pre-established formal encounters [Isaacs96].

The VESCL interface design is based on two metaphors: the *hall* and the *collaboration room* metaphors. Through the *hall* metaphor we provide the virtual environment to promote the casual and informal interactions among the users. When a user is in the hall, he or she can talk and know new users. The *collaboration room* metaphor [Grenberg98] helps to represent the shared work environments. Figure 1 shows a virtual environment with the metaphors.



Figure 1. *Hall and collaboration rooms metaphors.*

A collaboration room can be in three different states: open, close or half-open (public, private or restricted). An *open room* means that any user can enter on it. A *close room* means that the users do not want to be interrupted. A *half-open* room indicates that only some members (defined by the coordinator) can enter on it.

2.2. Tools

There are some tools to facilitate the interaction and collaborative work among the users. The tools are: a shared *table* in which the users can place shared objects (such as documents and videos); a *whiteboard*; a *slider*, which helps a user who wants to show a presentation; a *message box*, which allows to leave messages to other users (including users in others rooms); a *chat*; an *audio-video* tool which supports audio/video transmissions in real time; a *voting* tool which help to make decisions; a *collaborative editor*; a *control* tool, which provide floor control over shared resources and tools; a *users* tool, which locates users in the virtual environment; a *notes* tool to add notes to other objects or rooms; a *newsgroup* tool; a *card* tool, which have information about every user. Some other tools as the *calculator*, the *calendar* and the *clock*, show their results to all the users in the room.

The table 1 shows the VESCL tools, according to the kind of service provided and also according to their synchronous or asynchronous interaction nature.

| Services | Synchronous tools | Asynchronous tools |
|----------------------|-----------------------------------|--------------------------|
| Communication | Chat, Message box, Audio-Video | Message box, Notes |
| Collaboration | Table, Slider, Editor, Whiteboard | Table, Newsgroup, Editor |
| Coordination | Control, Voting | Control, Voting |
| Awareness | Users | Users |
| Others | Calculator, Calendar, Clock | Calendar, Clock, Card |

Table 1. Classification of the VESCL tools

Some tools can be used for both synchronous and asynchronous interactions. Every tool has their own awareness features.

When group uses a collaboration room, one of the users assumes the *coordinator* role. The coordinator can modify the state of the room (public, private or restricted). The coordinator also decides which tools the group need, so he or she can hide or make available every tool.

3. The VESCL Prototype

We built a prototype of the VESCL system on top of the Web. The prototype asks for an username and a password. Once validate, the user enters at the *virtual hall*, and can talks to other users, or get into some of the rooms. The following figure shows some of the tools.



Figure 2. Some tools of the VESCL prototype

The figure 2 shows a menubar which contains the available tools. The figure also shows the *desk* tool, the *audio-video* tool, the *whiteboard*, the *users* and the *chat* tools. A *virtual hall* with four rooms is also shown.

4. Conclusions and Further Work

We show a customizable CVE built on top of the Web, to promote the social interaction and collaborative work. The coordinator of every room can decide which tools the group need, according with the tasks.

The prototype was used in small research groups. At the moment to write this paper, we are trying to incorporate VESCL as a tool in a normal course of our university. As a further work, we are studying the use of VRML to provide a better user interface.

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