

A Web-enabled Communication Environment for the Education Community

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Abstract: The research and development of computer-based, networked learning environments will be built around electronic communication and collaboration services that will play a significant role in the improvement of the learning procedure. Applications of this kind provide tutors and trainees with the ability of continual, close and efficient cooperation, en masse as well as individually. The goal of this work is the presentation of a communication environment that was developed in the framework of Odysseas project. The flexible design and implementation of basic communication services, accompanied with a friendly user interface, comprise an ergonomic environment and ensure the introduction of information technology in education as a daily communication and collaboration tool.

Introduction

Most developed countries endeavor in introducing network technologies and network software into education. Modern educational networks support a set of general-purpose elementary network services that provide some essential communication facilities to the end users. These facilities include collaboration, navigation into information resources, as well as interpersonal communication among the members of the education community. A recent project of this nature is Odysseas [Bouras 1997]. Project Odysseas (Integrated Network of School and Educational Regeneration in Achaia, Thrace and the Aegean islands) started in 1996, under the guidance of the Greek Ministry of National Education and Religious Affairs (YPEPTH). ("Odysseas" is "Odysseus", the Greek mythical hero.). The goal of this project is the design, development and pilot operation of an integrated network of 60 school laboratories located in three remote Greek geographical areas, Achaia, Thrace and Aegean islands. According to a research that took place in Greek education community, basic network services, such as email, discussion groups and bulletin board [Bouras 1996] are regarded as substantial components of a communication process. The basic network services that have been implemented in the framework of Odysseas, are the email service, the bulletin board service, the discussion groups service and the directory system. Altogether, they comprise a sufficient solution for interpersonal communication that will satisfy the goals of synchronous learning theories and methods, result in the improvement of the provided education and familiarize students with information technology. A Web browser was chosen as the interface platform for the basic network services. WWW-based tools are easily accessible through a URL. This contributes to the integration of the educational working space in terms of a Web browser.

Design Issues

The major design principles for our environment were obtained as a consequence of the needs expressed by end users and experts in a project like Odysseas, which aims at the introduction and exploitation of network communication services in education community. The present environment is designed in a hierarchical, two-level structure, the *school level* and the *regional level*. The communicational needs of users of the same school are served on a school level basis, whereas the communication between users that belong to different schools is dispatched on a regional level basis. This way, the applications are fully operational within the school environment, even if the communication link between the school's NT Server and its corresponding main access point (regional level) is not available. The email service interacts only with the school's email server and therefore it is implemented on a school level basis. The bulletin board and discussion groups are implemented on a two-level basis: the bulletin boards and discussion groups concerning all Odysseas' users are stored in a remote

level, whereas those concerning the users of one school are kept in local level (here, the NT Server.) The directory service is a complementary application that operates as a directory system for the three basic services. It provides searching operations through white/ yellow pages and it is designed in a two-level fashion. This application may be used independently, but it is also launched by the other three applications, where a searching operation among Odysseas' users is available.

Functional overview and scenarios

Project designers took into consideration all the existing technologies in order to invent new ways of evolving basic services environment into a learning tool. It was also taken into account that emphasis should be given on the pedagogical value of these services and not on the unproductive incorporation of the available technologies. Following this rule, the basic services applications were designed and implemented according to the international standards. They offer all elementary and advanced features, presented in a way that would reduce the users' cognitive overload. Special features are also available, that would contribute to the better understanding of the communication procedure.

Implementation Issues

Most innovative Web technologies are used for the retrieval and storage of information. Particularly, activeX platform, vbscript and cgi scripts are used to overcome the disadvantage of WWW passive protocol, HTTP. ActiveX platform is based on the tested COM Windows technology. It provides a wide range of effective, easily adopted features and tools, such as activeX controls, which contribute to the deployment of a fancy user interface. A wide variety of activeX controls-clients of several network protocols are also available. SMTP and POP3 clients of email and discussion groups applications are substantially based on a SMTP and a POP3 activeX control. ActiveX components co-operate harmoniously with other WINDOWS applications. The only restriction is that taking advantage of activeX technology requires the use of Microsoft Internet Explorer 4 as a Web browser. For storage and retrieval of information, both *local access* and *Web access* is used (Figure 4). Local access is used in the school-level for reading/ modification of user's personal information, such as the user's profile or the personal email messages. Web access is used in the school and regional level for reading or modification of shared information, such as the bulletin board announcements.

Graphical User Interface

The environment has been designed, so as to provide a great degree of flexibility, without causing navigational difficulties and cognitive overload for users. The gradual presentation of the complete set of potentials for each application is achieved through the provision of several scenarios, that is different versions of the applications. In this way, the user will familiarize with substantial functions, using the easiest scenario, and gradually get acquainted with all the functions provided, using the most elegant scenario. Consequently, users enjoy a feeling of immediate confidence in their ability to master their new applications.

References

- [Adam 1993] Adam, J. (1993). Interactive Multimedia: Special Report .*IEEE Spectrum*, pp. 21-39.
- [Borko 1996] Borko, F. (1996). *Multimedia Tools and Applications*. Florida Atlantic University, Kluwer Academic Publishers
- [Bouras 1996] Bouras, C., Kapoulas, V., Kastis, N., & Spirakis, P. (1996). TRENDS: Training Educators through Networks and Distributed Systems. *EDEN Conference*, 8-10 July 1996, Futuroscope Poitiers, France, pp. 195-199.
- [Bouras 1997] Bouras, C., Hadzilakos, A., Koutlis, M., Panopoulos, N., & Spirakis, P. (1997). ODYSSEAS: The Greek Educational Network for Secondary Education. *EUROAMERITEL'97 Conference*, 5-7 November 1997, San Jose, Costa Rica