

TRENDS: TRAINING EDUCATORS THROUGH NETWORKS AND DISTRIBUTED SYSTEMS

Christos Bouras
Computer Technology Institute

Vaggelis Kapoulas
Computer Technology Institute

Nikitas Kastis
Lambrakis Research Foundation

Paul Spirakis
Computer Technology Institute

George Tsakarissianos
Lambrakis Research Foundation

Abstract

The TRENDS project aims at the in-service, distance training of 2,400 school teachers in Secondary Education, and the use of Information Technology and Telematics in the learning process, by six countries (Greece, Italy, Spain, Portugal, France, and United Kingdom). The training process will be implemented by flexible and distance learning methods, through the development and use of an in-service school-based training system, which will be based on multimedia telematics and existing mature network technologies, and the establishment and operation of a European Teacher's Training Network, consisted of six interconnected National Sites (Training Centre, schools and teachers per country). Each Training Centre in the Network will act as service provider to the schools and the teachers. The major aspect of the project is to provide the educator and their trainers, with various services including : e-mail contact with other educators and trainers, access to multimedia information, forums for the discussion and debate on educational projects, access to curriculum-related information for the educators, and multimedia teletraining for the conduction of lessons over the network. Due to the nature of the planned services and applications, the network infrastructure that will be used for the realization of the TRENDS, must offer high speed, multicasting, trans-European interoperability and certified quality of services.

Introduction

There is an agreement among the member states of EU that the New Information Technologies (NIT) can be of great potential value in education and that they will contribute to enhance such aspects as computer familiarisation, achievement, creativity, problem solving and co-operation between students. Also the use of NIT as a cross curricular tool is seen as one of the most important goals. For the above to happen, it is essential to train the educators in the use of the NIT. TRENDS [1] offers a system that can facilitate the preservice training as well as the inservice training (via the cascading model), of the educators and builds a platform that can be used in the future for the training of the students. It should be obvious that any enhancement to the educational system of a country has an immediate reflection to its citizens thus demanding encouragement of such projects.

The main idea of the project is the creation of a trans-European network that will offer telematics services, which will be used for the training of educators. The services will be implemented by education tools, which include among others the following:

- multimedia education tools and especially
 1. a tele-training tool that will make use of images, video and voice for the conduction of on-line lessons [2]
 2. a distance education tool that will offer remote access to multimedia-based lessons stored in geographically distributed databases [3]

- remote access to distributed databases that will store research results in various research areas.
- basic network services like access to World Wide Web, multimedia e-mail, news groups, etc.

The network will consist of six Training Centres, one in each of the six national sites, in Greece, Italy, Spain, Portugal, France and United Kingdom. An example of the proposed topology for TRENDS is shown in the Figure 1.

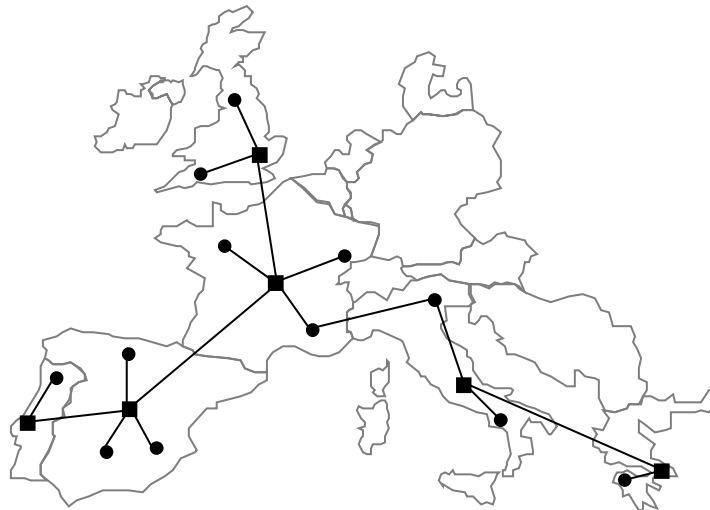


Figure 1: Proposed topology

The TRENDS project aims at the provision of an integrated distributed training environment for educators, that will aid efforts in the Open and Distance Learning area. A lot of productive work for the implementation of Distance Learning environments has been accomplished in various EC programmes. Among these, the projects carried out under the DELTA [4] programme are the ones that are more closely related to the TRENDS objective. More specifically, the focus point will be, the user needs, as they have been defined in the DELTA projects that will be used in order to form a basis on which the specific user needs for the TRENDS user group will be deployed and customized. The indexing and processing of experiences with various platforms will help TRENDS implementors in the design of robust tools by avoiding mistakes and integrating strong points of previous designs. TRENDS, is complementary to most of the related projects, because of its characteristics that can be summarized in the following points,

- The tools that will be used/implemented have a refined, and thus less generic, purpose and are targeted towards the satisfaction of the educators' user needs.
- The tools will be integrated, thus creating an environment that will offer various services over a common infrastructure and with a common design philosophy.
- It addresses a well defined user group which has not been previously considered under this framework. This group has the special property that it needs continuous training

General Design

The TRENDS project, will establish a network based on existing technologies of EURO-ISDN. The connections will have a minimum bandwidth to guarantee the proper delivery of the services (e.g. 64 Kbps). The underlying network will support various services that aim in the training of educators. The implementation of these services is based on the use of existing software tools (modified for the purposes of the project) that are integrated under a common user interface. These services are complemented by the organisation of already existing education material and the implementation of new material mainly concerned with the use of NIT by the educators in the educational process.

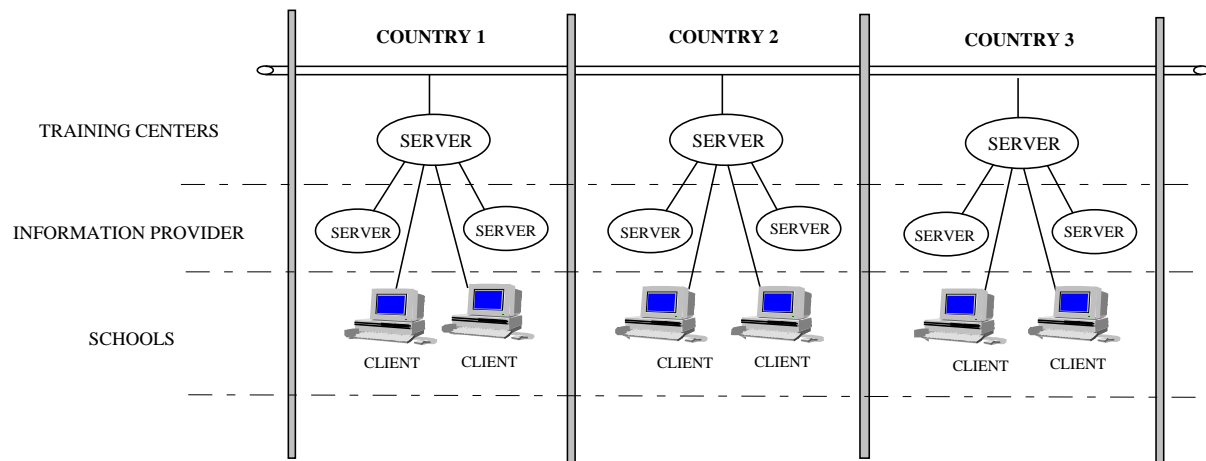


Figure 2: Example of the Network Site Configuration

Due to the nature of the planned services and applications the network infrastructure that will be used for the realization of the pilot phase, must offer :

- High speed: The proposed services and applications due to the fact that they transmit big amounts of data require a minimum network speed, so as to provide timely responses to the user.
- Multicasting: The nature of the distance training and education tools requires that the trainer's node must send data to multiple nodes in which the trainees reside.
- Trans-European interoperability: The aim of the project is to offer the education services in a European scale. This means that the trainees and the trainers will be distributed in various European countries. Thus the network infrastructures must admit a high degree of interoperability.
- Certified quality of services: Since some of the educational services offered by the tools cannot function properly, if the network services used by them are not meeting certain criteria, the network infrastructure must guarantee that these criteria are fulfilled.

Teachers' Network

The network [7] will be consisted of six Centres, one in each of the six national sites, in Greece, Italy, Spain, Portugal, France and United Kingdom, which will act as service providers to the teachers in their schools. In each of the Centres a WWW Server will be set up and the appropriate administration and authoring software will be installed. In each of the 120 schools a client software will be installed. In such a way a significantly large number of European school teachers will be given the capacity to access valuable information available in the cyberspace, with a friendly and time efficient way, and to participate in teletraining courses as well as in interactive work sessions. The national site configuration consists of the following (see Figure 2):

- The Training Center, in which the various servers that facilitate the provision of the TRENDS services are located. Concerning information providers, some of the TRENDS partners as well as the sponsoring partners (Ministries) will provide multimedia information (courses) in different servers. This configuration is compatible with the model of the strongest network operators, although its implementation may differ depending on interests.
- The schools that are connected to the Training Center of their country. There, the necessary client software to access the services offered by the TRENDS Network, will be installed.

User Services and Tools

The demonstrator will offer an integrated environment that will provides to the educators and their trainers the following services:

- Personal communication services. These will be based basic network services and include e-mail, access to multimedia information, forums for the discussion and debate on educational subjects and access to educational networks [5]
- Multimedia tele-training tool. This tool will allow the delivery of remote training sessions from the trainer to the educators. A training session offers both the trainers and the educators the following services,
 - ◆ Preparation of the training session
 - ◆ Participation in a lesson
 - ◆ Distribution of the material for the training session
 - ◆ Coordination of the training session
 - ◆ Review of the training session's material

The implementation of the tele-training tool involves,

- ◆ the combination of already existing tools for preparing and interpreting multimedia training material, Computer Supported Cooperative Work, desktop videoconference and delivery of multimedia information over network,
 - ◆ the development of software modules for the cooperation and the synchronization of the previous tools, and
 - ◆ the development of the appropriate user-friendly GUIs.
- Multimedia distance education tool [6] and video distribution of lessons. These tools offer a way to access off-line lessons that reside in remote servers. The services offered by them are,
 - ◆ Lesson preparation
 - ◆ Search for a lesson
 - ◆ Access to a chosen lesson
 - ◆ Navigation with the use of hypermedia semantics
 - ◆ Continuation of a lesson
 - ◆ Progress supervision

The implementation of the distance education tool involves,

- ◆ the combination of already existing tools for distribution of hypermedia documents, preparing hypermedia learning material, delivery of multimedia information over network,
 - ◆ the development of software modules for the arbitration of the user requests and the cooperation of the previous tools, and
 - ◆ the development of the appropriate user-friendly GUIs.
- Tool for accessing distributed databases with research results on specific subjects. This results will be organized not only as conventional papers but also as multimedia documents. Both the trainers and the educators will be provided with the following facilities,
 - ◆ Searching for research results using various criteria such as key words, exact titles, cross-references, etc.

- ◆ Accessing a chosen result.
- ◆ Downloading a selected result.
- ◆ Accessing other related results.

A user-friendly GUI and software modules for accessing the databases, searching for results and delivering them over the network will be implemented.

- ◆ Off-line contact with a trainer. This service will offer the ability to educators to register questions concerning the material studied by them. The trainers will be able to answer them and clarify any difficult points. This service will be implemented by employing the basic network services, such as e-mail, news group, etc.

Conclusions

The project will contribute to the introduction of the innovative uses of Telematics in Education, a domain considered critical in all the EU policy documents regarding the Information Society. The expected final product of the TRENDS project will be the distance training system and the European Teachers' Network, as a delivery platform of the services, consisting of 6 interconnected national Training Centres as service providers. The European industries will test the viability of a number of services to support in-service training, at the working place.

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