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ODL SERVICES AND PTTs: THE GREEK PTT CASE

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Abstract

During the last years Open and Distance Learning (ODL) methods that utilise network resources and services are gaining wide acceptance. An increasingly number of enterprises uses ODL for training their employees. Interestingly enough not all the enterprises that want to and can use ODL are doing so. The role of PTTs is important in here. PTTs can provide not only the connections necessary for the implementation of ODL services but the ODL services themselves, thus making the process of adopting ODL easier for the enterprises. In Greece the main PTT organisation, as part of its strategy to offer integrated telematics services in various areas, designed and currently operates a pilot network offering ODL services. The services offered include among others Synchronous Distance Education, Asynchronous Distance Education, Co-operative Learning etc.The network utilises ISDN links to connect the users of the ODL services (either trainers or trainees) to a central site. This site is used to interconnect the users among themselves, and to host the services and any educational material needed. The ODL services can be offered either over ISDN services or over the Internet (using TCP/IP services and applications). In the first case the central site utilises a Multipoint Control Unit (MCU). In the second case the ISDN lines are used to the implement the connections to the Internet, and the central site utilises a powerful server. Each user may access the ODL service using an ISDN enabled personal computer. Small groups of users that wish to participate from the same location can be accommodated using larger displays. The ODL services (and the network that supports them) are currently being used and evaluated by a variety of organisations and enterprises including schools, hospitals, vocational training centres, etc. The results of the evaluation will be used to guide the deployment of the system in full scale.

1 Introduction

The last years we notice a shift in the training delivery [5]. Also the costs are considerably smaller in distance learning than traditional learning [4,5]. This arises the need to implement tools and to design networks those support ODL services. (asynchronous learning, synchronous learning and Computer Support Collaborative Work for Learning - CSCW/L).

ODL could be regarded as the process of learning with the use of Telematics that is the combination of telecommunication, information and multimedia technology and its services.

ODL has as target the development and promotion of special methods and techniques for the increase of the quality, the effectiveness and the suppleness of the learning. The ODL has two main results

- The educational: The improvement of the existing learning methods and the development of new learning methods.
- The technological: The provision with new distance learning methods with the use of Information and Communication Technologies (ICT)

An ODL environment combines various instructional scenarios such as collaborative learning and education with or without the live presentation of the Professor. Such an environment could be very useful for the enterprises.

The ODL environment is a common environment for the implementation of all the above scenarios and the way to success in specific educational targets such as:

- The incentives for the diffusion of information among the employees in the enterprise
- The encouragement for the collaboration.
- The motivation of the trainees (employees) with the use of effective and modern equipment for the lesson.

- The effective transmission and distribution of the instructional material to the trainees (employees).

These targets indicate that all modern enterprises should at least consider and apply (where possible) ODL. Interestingly enough not all the enterprises that want to and can use ODL are doing so. This is especially true in Greece where the enterprises are not big (i.e. they are mostly SMEs). This reluctance by the Greek enterprises in adopting and implementing ODL techniques is attributed mainly to the following reasons: lack of technical knowledge, poor infrastructure, and lack of support.

The role of PTTs is important here. ODL is closely related to telecommunications, therefore PTTs can provide not only the connections necessary for the implementation of ODL services but the services themselves. This will facilitate the process of adopting ODL easier for the enterprises.

In Greece, the main PTT organisation (i.e. Hellenic Telecommunications Organisation) has decided to extend its business, and enter the market of advanced network services. In this direction an operational plan has been elaborated. The Greek PTT, as part of its strategy to offer integrated Telematic services in various areas, designed and is currently testing under several ODL scenarios various services that will be offered to the public.

2 ODL Services

In order to achieve the above described goals the first step is to define the ODL services.

The ODL services, which are offered, are the following:

- Synchronous Distance Education. During the synchronous lesson there is live interaction between the participants (trainer and the trainees). The arranged day and time of the lecture, the trainer and the trainees join the session. The trainer can make his lecture with the video/audio applications and can use the whiteboard, which simulates the blackboard of a traditional classroom. The trainer may project educational material in the whiteboard or slides in a document camera. Furthermore the trainer can share data or applications with the trainees and chat with them.
- Asynchronous Distance Education. In the asynchronous distance learning the trainee selects the time, the duration and the pace of the lesson.
- Computer Support Collaborative Work for Learning. The CSCW/L functionalities include application sharing, bulleting boards, chat, e-mail and sharing workspace.

The Synchronous Distance Education can be offered either over ISDN services or over the Internet (using TCP/IP services and applications). In order to accomplish it we implement two tools with identical functionalities.

The Asynchronous Distance Education and the CSCW/L can be offered only using TCP/ IP protocols and applications over ISDN. We implement an environment that integrates these services.

3 Network architecture

The services have to be supported by a suitable network infrastructure. This network infrastructure has to satisfy some requirements i.e.

- It should cover a wide geographical area and exploit the existent technology of the Greek PTT. The general network architecture is based on the public ISDN network. Notice that this is in accordance with the practice applied by many enterprises that used the ISDN network to implement ODL.

- It should support easily the above described services, therefore it should support both synchronous and asynchronous communications. The telephony services and some other synchronous communication services (e.g. videoconference) are implemented natively by the network itself. For the other (mainly asynchronous) services widely acceptable protocols (PPP and the TCP/IP suite) were used to implement a computer network over the ISDN infrastructure.

- It should support both telephony and computer networking. Various nodes are interconnected using the network. These are either trainees' or trainers' nodes or supporting nodes.

- It should not be expensive to use. The supporting nodes contain the necessary equipment and server software in order to provide the services to the trainees (typically a Multipoint Control Unit – MCU, a router with a Primary Rate Interface ISDN card, an enterprise server, server software etc.)

3.1 Pilot implementation

The Computer Technology Institute (CTI) implements the above ODL services over a pilot network which is based on the public ISDN network infrastructure of the Greek PTT. This pilot network was implemented in order to test the above described services. It consists of a few central nodes (i.e. representing enterprises' premises) and several remote nodes representing the trainees and the trainer. The pilot network architecture is shown in figure 1.
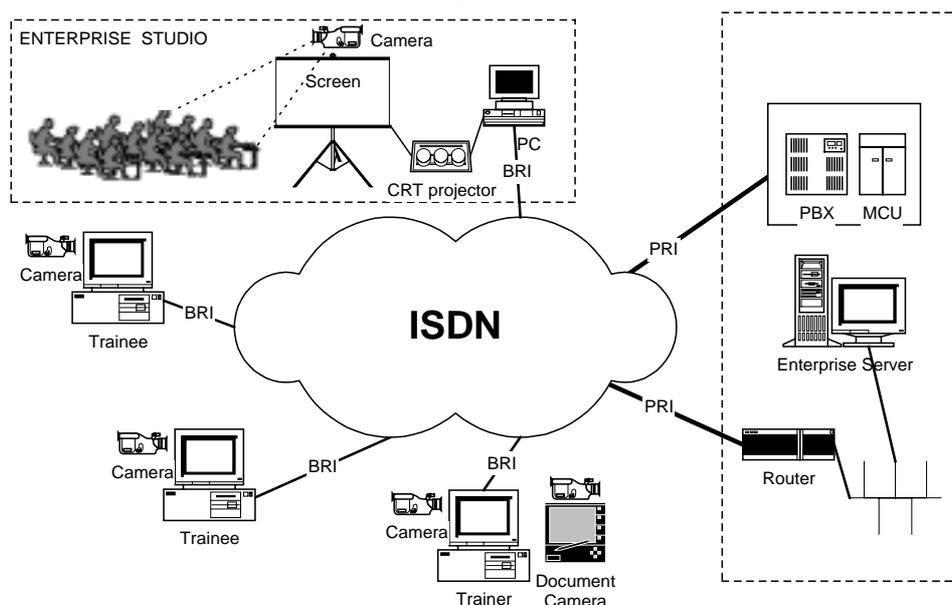

Figure 1: The pilot network architecture

The central nodes are equipped with an ISDN PBX, an enterprise server (including all the necessary software packages, such as e-mail, ftp, WWW and groupware servers etc.), and a router. These nodes are connected to the public ISDN network via a few (one or two) Primary Rate Interface (PRI) ISDN links. One of the central nodes is also equipped with an MCU.

If the ODL services offered using the ISDN services the central site uses MCU to interconnect the users. On the other hand if the ODL services offered using TCP/IP services and applications the central site acts like an Internet Service Provider (ISP).

The trainees' nodes are equipped with a personal computer (equipped with all the necessary network communication software and the possibly needed advanced video teleconference and

collaboration hardware and software tools). These nodes are connected to the public ISDN network via one or a few Basic Rate Interface (BRI) ISDN links.

The software tools are selected in order to accomplish the special ODL needs. Also the tool that we implemented (and acts as client) characterized by ease of use and simplicity. The server applications characterized by reliability, high performance and support large number of users.

4 Evaluation

The evaluation of the pilot implementation has two phases. In the first phase the Greek PTT and Computer Technology Institute did the internal evaluation. The pilot network was used by trainers from CTI and managers from the Greek PTT. The second phase, which is the external evaluation, is currently in progress. A few selected enterprises that showed interest use the pilot system in order to train their managers and staff. After the end of the evaluation period their comments will be used to improve the system and implement the full-scale version of it.

5 Conclusion

Many enterprises showed interest to use ODL services in order to train their staff. The next step is the integration of the network and the services as well as the instruction of people for the support of this services and network. In the near future these services will be made available to the public and the Greek enterprises will find an easy way to benefit from the advantages that ODL has.

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