

Training Centres : An Architecture for the Realisation of Open and Distance Learning Environments using Telematics.

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Abstract: In this paper, we are describing an architecture for the realisation of Open and Distance Learning (ODL) Environments using Telematics. The approach of using Training Centres as dedicated education services providers, located at the premises of an educational authority is discussed. These Training Centres may be Points of Presence of an international educational network (as is the case in the TRENDS Project in the context of which Training Centres were studied). Crucial aspects of the feasibility study, aiming to investigate the operational and organisational conditions of the Centres, that must precede the implementation of a Training Centre, are cited.

Introduction

The rapid technological advancements and their impact were recognised by the European Union which assigned the task of investigating the various trends and of defining the needed actions to the Bangemann Commission. The commission in its report defined ten sectors to which priority should be given and in which the teleworking and distance education activities were included.

The aim set by the Bangemann Commission for the area of distance education is the provision of a continuous educational process which will satisfy the needs imposed by an ever shifting and changing society. The achievement of this aim is envisioned through the following actions:

- The establishment of distance education centres. These centres are expected to fulfil their purpose by making extensive use of Telematics and network-based distance education software.
- The establishment of advanced distance education techniques to schools and universities.

The application of the above structures is expected to offer advantages to:

- the industry, especially to the SMEs, and to the public sector since it will allow the education of staff members with lower costs and with better utilisation of the finite available educational resources,
- the employees who need to upgrade their knowledge and skills,
- the people who are either unable to move outside of their houses or reside at remote geographical areas,
- the students who seek to have access to educational material of higher quality than the offered one.

The above mentioned trends result at the need for training people in the use of the New Information Technologies (NIT). Significant help, towards the satisfaction of this need, can be acquired by the use of Telematics as it is applied in the network-based distance education software.

The TRENDS Project

The TRENDS Project aims at the development and efficient delivery of in-service training to school teachers, thus improving the quality of the educational services of public interest and, at the same time stimulating the creation of new jobs in the education and training sector. The methodology focuses on the enhancement of existing ODL techniques, in the area of multimedia telematics, by practising the latest methods of Information Services Engineering, in measuring the application as well as the socio-political feasibility in the domain of life-long learning. The objectives of the project are:

- The development of an in-service, school based teachers training system, based on multimedia telematics, to support the continuous improvement of teachers' skills and capabilities in Secondary Education, in Europe.
- The implementation of distance learning techniques, to provide viable and cost-effective school based training.
- The establishment and operation of a European Teachers' Training Network, to provide the distance training.
- The validation of the distance training services, by training 2,400 teachers from 120 European public secondary schools.

Training Centres: A Centralised Architecture

For the uniform provision of the services that will be offered by the TRENDS Network in a pan-European level and the enhancement of co-operation of the participating countries in various educational issues, the six national sites, in Greece, Italy, Spain, Portugal, France and United Kingdom, will be interconnected through mature network technologies (Euro-ISDN, TCP/IP protocol suite), so as to act as service providers to the teachers in their schools.

The basic idea of the TRENDS network is that the six Training Centres (one per participating country) will have to interact with each other transparently and will play the role of the educational services provider in their National Teachers' Training Network. The same idea could be applied to every organisation planning to offer similar educational services, either to a national or international level. The outcome of such an implementation would be the establishment of an educational network.

The Training Centres approach to the realisation of Open and Distance Learning Environments is a centralised architecture with the following advantages:

- The Training Centre can be hosted in the premises of an educational authority, who will be responsible for the content and the model of the offered services.
- The technical support will be much more efficient if the hardware and the software modules involved reside in the same place.

The establishment of a Training Centre should be preceded by a feasibility study, aiming at defining the context into which a Training Centre will operate. The following parameters has to be considered as critical elements to be discussed and investigated, in order to cover the aspects considered as most important in the Feasibility Study for the establishment and operation of a Training Centre aiming at supplying Open and Distance Learning Services.

A Training Centre should be considered as a distance training services provider, that is going to address the needs of the demand (society), for the provision of educational services in the context of the life-long learning.

When devising, developing and putting into practice services (or training services, as it is happening in the TRENDS context) three major elements need to be taken into consideration: the *implementation environment* representing the context into which learning technology products and services are placed; the *implementation design* comprehending the analysis of the opportunities present in the implementation environment, the formulation of implementation strategy and plan of action; the *action* occurring as a result of the implementation design and corresponding with service delivery.

The concept of implementation environment includes the understanding and characterisation of some other components which are necessary in order to develop properly the feasibility study. This is to say, the factors involved in the implementation, the “market” structure and possibly the related socio-economics dynamics. What is intended for “market” structure is obviously influenced by the institutional context in which training takes place.

Once drawn the scenario in which a Training Centre is supposed to supply its services, the other side of the coin to be surveyed consists of the innovation dimensions which come up and affect the drawing-up of a feasibility study.

They are respectively technical, economic and organisational. Another basic innovation dimension is the pedagogical one. A training model should be established, that is a model through which the training services are going to be offered. This training model is a very important phase in the feasibility study of a Training Centre. It will affect the content of the training material used and the evaluation method of the trainees. It is deemed imperative that the training model needs to be decided, applied and monitored by education experts.

Here it is worth saying that, from this standpoint, any effort will have to be done to put into operation some general principles underlying the design process:

- to make explicit the new educational concept underlying learner-based systems which are centred on the learning-paradigm rather than the teaching paradigm, namely on knowledge acquisition rather than knowledge transmission;
- to guarantee a maximum level of interaction between trainees/teachers and among the trainees themselves (this in the perspective of an evolution towards distance training systems of third generation);
- to foresee communication flows to collect bottom-up suggestions.

When selecting a technological configuration for a certain learning environment, the technical feasibility involves the consideration of some factors such as:

- *learning functions* (transmission of knowledge and information communication among trainees, tutoring, guidance, exercises, etc.).
- *key features* (real time, delayed time, one-way, two way, one to many, many to many, use of text, use of sound, use of still images and use of moving images).
- *technology components* (they cover a full range of delivery mechanisms based on information, telecommunications and multimedia technologies).

The economic feasibility can be considered from two different viewpoints: the former concerning the provision of services, which is more focused on the survival of the product/service, the latter concerning the adoption of the product/service and more focused on questions about cost, economic efficiency, risks and investments.

Finally, the organisational feasibility requires to foresee the necessary measures to prevent organisational problems from being obstacles in implementing the training scheme and to design roles and functions to maximise efficacy and compatibility of it within the organisational context of implementation.

Also in this case, as in the one of the pedagogical dimension, the respect of some general principles underlying the design process needs to be guaranteed.

This is to say that:

- the outcome of the services offered from the Training Centre has to work as an engine for additional/complementary initiatives at regional/local level,
- training practices based on networks and distributed systems have to be embedded in the mainstream of re-education activities, and
- training services need to be consistent not only with present competencies that are required but also with the ones they may be required by the coming rapid reforms concerning the working class of the years to come.

References

EDUCATIONAL SOFTWARE AND MULTIMEDIA: Intermediate report, EUROPEAN COMMISSION, *Task Force "Educational Software and Multimedia"*, 24/1/1996

Using Information Technology in Careers Education and Guidance: getting started. (1996). NCET.

TRENDS-TRaining Educators through Networks and Distributed Systems, ET-1024, Technical Annex

Superhighways for Education: The Way Forward. (1995). *DFEE Information Branch*. Crown Copyright.

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