Nodes e-learning network development

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Abstract

The NODES project aims at facilitating, for adult training / lifelong training, the use of multimedia knowledge to improve competitiveness employability and mobility of handicapped adults (physical and sensorial) and of adults victims of the digital divide or of some of its components such as distance, initial level of knowledge, language, use of complex technologies. The project will provide an open platform for content providers (teachers, trainers, researchers and academics but also workers, farmers, entrepreneurs) who are willing to disseminate their knowledge. The NODES project is focused, on the wide sense, on the production and diffusion of knowledge created within public and private organizations dedicated to adult training or by individuals, through Europe.

Keywords: e-Learning, Logical and technical architecture, Lifelong learning, multimedia

1. Introduction

The SOCRATES GRUNDTVIG NODES project aims at promoting the use, in adult training / lifelong learning, of multimedia knowledge, in order to facilitate competitiveness, employability and mobility of adults who are victims of the digital divide or of some of its components such as distance, initial level of knowledge, language, use of complex technologies. There are three target groups: the people victims of physical and sensorial handicaps, the victims of digital divides and/or of a social handicap, the rural inhabitants (distance handicap). Lots of these people often have several handicaps: geographical and social isolation, handicap and digital divide. This is why the NODES device proposes to reach these target groups through the intermediary institutions and their networks. Each partner-country will associate one specific test group, for whom the follow up will be integrated to the project.

They are taking part 6 countries in the project: France (ENESAD), as coordinator, Czech Republic (Agricultural University of Prague), Ireland (University

of Cork), Hungary (University of Debrecen), Romania (University of Sibiu), Spain (Technical University of Madrid).

Seven sessions and responsible of the consortium accordingly the aims of the project are the next:

- Coordination, Animation, Management, Monitoring (ENESAD-CNERTA)

- Specification of Needs and contents (ENESAD-CNERTA)

- Specification of devices/Tools; System design and network (University of Cork)

- Preliminary Interface Design (Technical University of Madrid)

- E-learning systems evaluation, which can be used in the NODES project (University of Debrecen)

- Technical implementation (Agricultural University of Prague)

- Training methods and validation (University of Sibiu)

In the 3 years project the consortium using the training and multimedia systems as a capital equipment. This lecture is reviewing the achieved results in the sessions so far.

2. e-Learning and Target Group

2.1. Levels of e-Learning

E-learning falls into four categories, from the very basic to the very advanced. The categories are:

- **Knowledge databases.** While not necessarily seen as actual training, these databases are the most basic form of e-learning. You have probably seen knowledge databases on software sites offering indexed explanations and guidance for software questions, along with step-by-step instructions for performing specific tasks. These are usually moderately interactive, meaning that you can either type in a key word or phrase to search the database, or make a selection from an alphabetical list.

- **Online support.** Online support is also a form of e-learning and functions in a similar manner to knowledge databases. Online supports come in the form of forums, chat rooms, online bulletin boards, e-mail, or live instant messaging support. Slightly more interactive than knowledge databases, online support offers the opportunity for more specific questions and answers, as well as more immediate answers.

- **Asynchronous training.** This is e-learning in the more traditional sense of the word. It involves self-paced learning, either CD-ROM-based, Network-based, Intranet-based or Internet-based. It may include access to instructors through online bulletin boards, online discussion groups and e-mail. Or, it may be totally self-contained with links to reference materials in place of a live instructor.

- **Synchronous training.** Synchronous training is done in real-time with a live instructor facilitating the training. Everyone logs in at a set time and can communicate directly with the instructor and with each other. You can raise your cyber hand and even view the cyber whiteboard. It lasts for a set amount of time - from a single session to several weeks, months or even years. This type of training usually takes place via Internet Web sites, audio or video-conferencing, Internet telephony, or even two-way live broadcasts

2.2. Benefits of e-Learning

E-learning has definite benefits over traditional classroom training. While the most obvious are the flexibility and the cost savings from not having to travel or spend excess time away from work, there are also others that might not be so obvious. For example:

- It is **less expensive** to produce – Using the adequate software to produce your own asynchronous training programs, e-training is virtually free once you reach the break-even point. Synchronous programs will have continued costs associated with the instructor managing the class, but will still be lower than traditional courses.

- It is **self-paced** – In some e-learning programs, the "books" that you set up create a module-based design allowing the learner to go through smaller chunks of training that can be used and absorbed for a while before moving on.

- It moves **faster** – e-learning courses progress up to 50 % faster than traditional courses. This is partly because the individualized approach allows learners to skip material they already know and understand and move onto the issues they need training on.

- It provides a **consistent** message – E-learning eliminates the problems associated with different instructors teaching slightly different material on the same subject. For company-based training, this is often critical.

- It can work from **any location and any time** – E-learners can go through training sessions from anywhere, usually at anytime. This Just-In-Time (JIT) benefit can make learning possible for people who never would have been able to work it into their schedules prior to the development of e-learning. (If you manage a corporate learning program, however, be careful about requesting that workers learn on their own time from home.)

- It can be **updated easily and quickly** – Online e-learning sessions are especially easy to keep up-to-date because the updated materials are simply uploaded to a server. CD-ROM-based programs may be slightly more expensive to update and distribute, but still come out cheaper than reprinting manuals and retraining instructors.

- It can lead to **increased retention** and a stronger grasp on the subject – This is because of the many elements that are combined in e-learning to reinforce the message, such as video, audio, quizzes, interaction, etc. There is also the ability to revisit or replay sections of the training that might not have been clear the first time around. Try that in a crowded auditorium!

- It can be **easily managed** for large groups of students – Some e-learning platforms allows corporate training directors, HR managers and others to keep track of the course offerings, schedule or assign training for employees and track their progress and results. Managers can review a student's scores and identify any areas that need additional training.

There are many advantages to e-learning, and even the potential disadvantages (i.e. boring text-based courses, technophobia, loneliness) can be alleviated with a properly designed course.

2.3. Target groups

In each country, a test group made of final users and actors of intermediary institutions will be associated to the work. NODES will contribute too by providing to the networks of adult training institutions:

- the technological infrastructure for harvesting, validating, interfacing and accessing to knowledge

- training for trainers / users and the competences necessary to the use of these technologies and services

- a local / regional node for the "creators" of knowledge, of multimedia contents, which can be NGOs, autodidacts, social key agents, institutions

- the development (definition) of methodologies linked to the digital contents for training: production, integration, use

- the access to contents through digital diffusion channels (Internet, television, satellite), according to the technologies available on territories and/or the modes of use

- the definition of the conditions and modes of access and marketing of contents;

- the diffusion and dissemination of information related to these technologies, methodologies and services applied to training.

NODES is mainly aimed at some "disadvantaged" publics: those living in the rural world or in isolated areas ("the distance handicapped"), those victims of physical or sensorial handicaps (visual, sound for instance) and those victims of the language handicap (immigrants and migrant workers), which explains the development of specialized interfaces. There are 3 levels of target groups:

- content producers

- intermediary structures (between content producers and final users), for example training centres and trainers

- final users: learners.

2.4. Specification of Needs in Training for Target Groups

- The adult needs

- The needs of the trainers, tutors, monitors

- The needs of the administration of the organisations and the needs of the administrators of the education system

- The needs of the Education Content providers in a broad sense; Content = Knowledge databank

- The needs of the Content Manager of the technical system (System to manage Content, Access and Services)

3. NODES Logical and Technical Architecture

3.1. NODES Technical Architecture

- The Trainee / Learner Workstation (TLW)
    - Technical specifications - TLW / User equipment (minimum)
        * Hardware and software
- The Teacher / Trainer / Tutor Workstation (TTTW)
    - The network connection is for collective and individual uses at home or the workplace
    - Technical specifications - TTTW / User equipment (minimum)
    - Tools for communication, collaborative working, if necessary
    - Tools for content management (updating, production, etc)
- The local network infrastructure (training centre)
- The personal Internet connection (at home, at the farm, etc)

 – The equipments and software to connect a personal PC to Internet.

• The Internet connection for the Training Centre (TC)

 – The equipments and software to connect a local network and server to
   Internet.

3.2. NODES Logical Architecture

In this part we give a short overview of the NODES logical architecture (Figure 1). In the Figure 1 you can see how build up the NODES Network (central repository) and how to connect the participant countries and the actors (trainer, learner, content designer and manager). Below we are giving an explanation of the used acronym and background content.
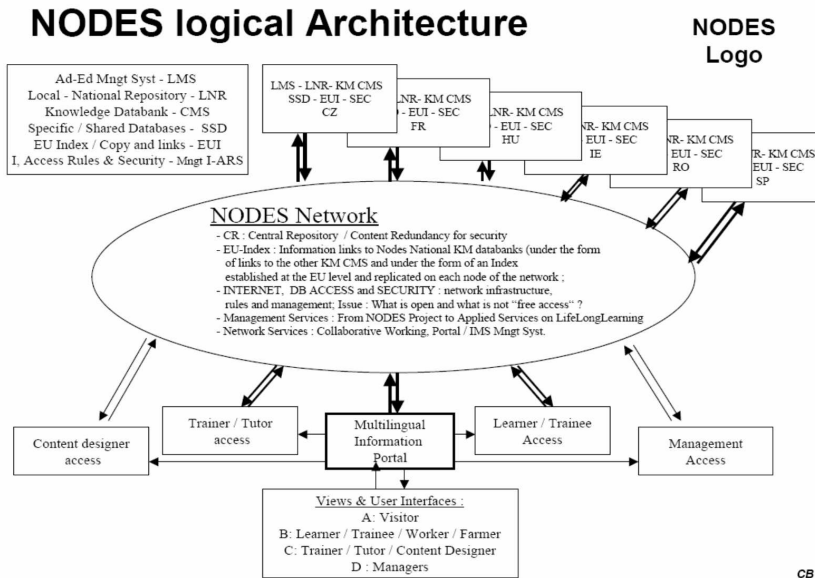

Figure 1: NODES Logical Architecture

3.2.1. Learning Management System, LMS

• The LMS Trainer/Trainee Management System including:

 – advanced information, assessment and positioning, registration

 – training process and pedagogical walkway structured / organised in sequences and pedagogical activities

- assessment and tracking and if necessary, the financial aspects

- personal or career guidance and information as well

- With interface and content presentation based on accessibility rules, as highest degree as possible.

3.2.2. Local - National Repository, LNR

- The Local - National Repository - LNR logical architecture and software to manage the elementary objects that could be included into developed / elaborated / composed objects and into the training process, to support individual or group pedagogical - training activities

- It is not open / not free access

  - the LNR is based on different type of software like CMS, Wiki with validation

3.2.3. Knowledge Databank Management System KD CMS / KMS

- The Knowledge Databank - KD CMS (Content Management System) - open Knowledge Databank, public access resources, with interface and content presentation based on accessibility rules.

- The KD Content must be validated.

3.2.4. Specific and Shared Databases, SSD

- The Specific / Shared Databases - SSD are dedicated databanks to specific contents like video, photos, sounds, which needs dedicated servers with large storage capacities, supporting contents, that could be shared between the partners.

- The process of exchange and content transfers between partners should be established for instance the bit torrent technology for downloading.

3.2.5. EU Index, EUI

- The EU index, EUI, is the local implementation of the central, common and shared index.

- The process of updating and maintenance must be established, tested and validated.

- The EU Index, the merging of each local - national index (based on KD and selected links like available resources / web sites / etc.) must be based on existing software and known procedures.

3.2.6. Internet, Content Access and Security Rules, I-CASR

- The Internet, Content Access and Security Rules, I-CASR describes the procedures and rules to manage safely Internet access, Contents, Databases, their organisation and management.

- Rules and procedures are established by the managers of the local infrastructure and services. They should be (briefly) presented to every partners and assessed for compatibility and interoperability of the NODES services.

3.3. NODE point: Physical implementation and network infrastructures

- Based on existing computers or servers and IP based networks and IP based telecommunication provided by each node Point of the NODES Network and system.

- Should be described by each partner and assessed during the project.

3.4. The NODES virtual central services and infrastructure

The NODES Network

- CR: Central Repository / Content Redundancy for security

- EU-Index : Information links to Nodes National KM databanks (under the form of links to the other KM CMS and under the form of an Index established at the EU level and replicated on each node of the network ;

- Internet, Content and DB-access, and security: network infrastructure, rules and management. Issue: What is open and not.

- Management Services: From NODES Project to Applied Services on Life Long Learning

- Network Services: Collaborative Working, Portal / IMS Management System.

3.4.1. Asynchronous and RT (Rural Transport) Services and Support in Adult Education

- Tutoring / mentoring Asynchronous services

- Tutoring / mentoring RT services

3.4.2. IP Networks and Internet

- Infrastructure constraints

- Telecommunication services

3.5. The services of the NODES project management

- Collaborative working:
    - the Marratech system,
    - IP videoconference
- Infrastructure for support and exchange
- Development and prototype

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