



# On-line Learning for North-West of Russia

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## 1 Introduction

Development in information technology impacts all fields of educational research, from basic to applied. The described projects are based at interdisciplinary research on new Internet technologies which results may be implemented in a wide variety of practical distance learning courses.

Two distance learning (DL) courses "Up-to-date construction management" and "Business planning and investment analysis" were developed and successfully carried out by Vocational Renewal Centre "Management and Computer Technologies" in 1999-2001 within the projects partially supported by grants of Eurasia foundation ([www.eurasia.msk.ru](http://www.eurasia.msk.ru)). The major part of students (150 in total) present St.-Petersburg, Petrozavodsk, Archangelsk, Pskov, Vologda, Obninsk, Murmansk and other small and middle enterprises and companies of North-West region of Russia. The interest to distance learning courses may be explained by the fact that many managers in CIS companies are rather skilled engineers or accountants but do not have enough knowledge in new forms of management, finances and law.

## 2 Trends

The simple overview show that there are two opposite approaches to the organisation of distance learning in WWW. The first of them uses on-line mode, the second one - off-line. In the first case only a standard WWW-browser is required, while in the second case auxiliary software is necessary on the client host. Both of the systems, however, function in the framework of the client-server technology and use CGI interface, which is common for most of such systems.

It is worth mention that difference in these approaches is well correlated with the complexity of the corresponding learning material. For now, it is very difficult and at least inefficient to simulate complex processes via standard HTML (even with Java applets), therefore the use of special client software is justified.

Currently, the following methods of distance learning in Internet are well studied and widely used in practice:

- WWW as a data source without any efforts to maintain a DL system.;
- Server-hosted software development;
- Auxiliary client-hosted software development.



The most important directions of further development of Internet-based technologies which would help in maintaining DL systems, are (except Java or other script language applets):

- HTML extensions for CCI (Client Communication Interface);
- Synchronous conversation applications for WWW (analogs of Unix 'talk' or Windows 'chat').
- Multimedia newsgroups.
- Virtual reality.

### 3 Methodology

This paper deals with our experience based on the results of the first project devoted to management in construction companies. The main project objectives were:

- to design the course's structure and materials;
- to provide methodological, software and telecommunication implementation of learning material with the use of new technologies (WWW- server with lectures and tests for on-line work, CD-ROM for off-line study, teleconferences via INTERNET, feedback with tutors via e-mail, etc.);
- to develop special software tools for rapid prototyping of different DL courses and for maintenance of administration procedures.

The content of the course is equivalent to the 60 hours university course (authored by Prof. Kaplan and Dr. Maslova). Each student studied 70-80 paragraphs, passed through 8 tests, participated in 3 tele-conferences and took part in final test.

On-line learning procedure was the following (Fig.1):

1. the student gets information about the course on the Internet site or from the other place, he/she fills registration form and receives password and instructional material (CD-ROM);
2. then the student studies material and tests in individual pace, takes part in teleconferences under the tutor's guidance;
3. when the student finishes the study he/she passes through the final quiz and gets the certificate.

### 4 Architecture

The described project is based mainly on WWW-platform. WWW unifies several existing Internet protocols (such as ftp, http, wais, etc.) and one new (html) around the concept of hypertext which becomes standard *de facto* in DL.

The developed system gives the student the following modes of study:

1. Plain distribution of volumes of learning material. These include both online tutorials in standard formats (html, rtf, etc.) and some special interactive courses, intended to be run as local applications;

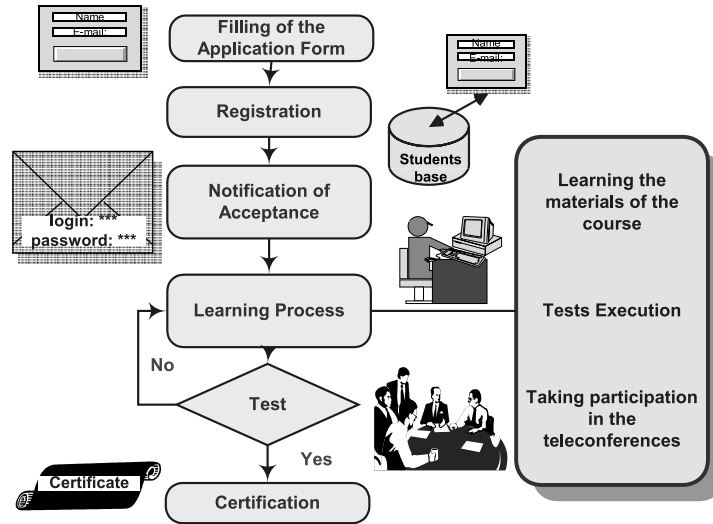


Figure 1: Learning process algorithm

2. Collaborative Learning in the network (via Internet-based teleconferences on special topics. Distant tutors work as moderators.);
3. Interactive online courses with immediate access via HTML browsers.

Implementation of B and C methods of DL requires special Internet programming tools which were developed.

Having analyzed some existing DL systems, which function in WWW, one may draw its typical structure. Usually the following active components which may be represented either by "real" human persons or special programs (here we enter the multi-agency) are found in such systems:

1. Tutor, which forms and presents learning material. It may be either a human being or a computer program (intelligent agent).
2. Supervisor, which watches and controls the learning process. Again, it may be either human person, or an special (agent) program.
3. Assistant, which tries to help student in various aspects of learning process. The fields of assistance may include domain knowledge, adaptation of interface, Internet usage, etc.

The other usual components of DL systems include

- Learning Material. It may be both hypertext and special training programs.
- External Data Sources. Everything not supported explicitly by the system, but required or recommended during education (hardcopy tutorials, video cassettes, etc.).
- Auxiliary Tools. This includes various computer techniques, which out of the scope of the system, but are required for it to function properly (such as communication programs).

- Administration subsystem.

Such typical structure may be implemented in different ways that is illustrated by many existing DL systems.

The special software tool "DOSTUP" that implemented main program functions was developed in new programming language PYTHON (with Tim Geleverya as main programmer) for rapid course development and project maintenance and support. Fig.2 shows the functional structure and architecture of the developed system.

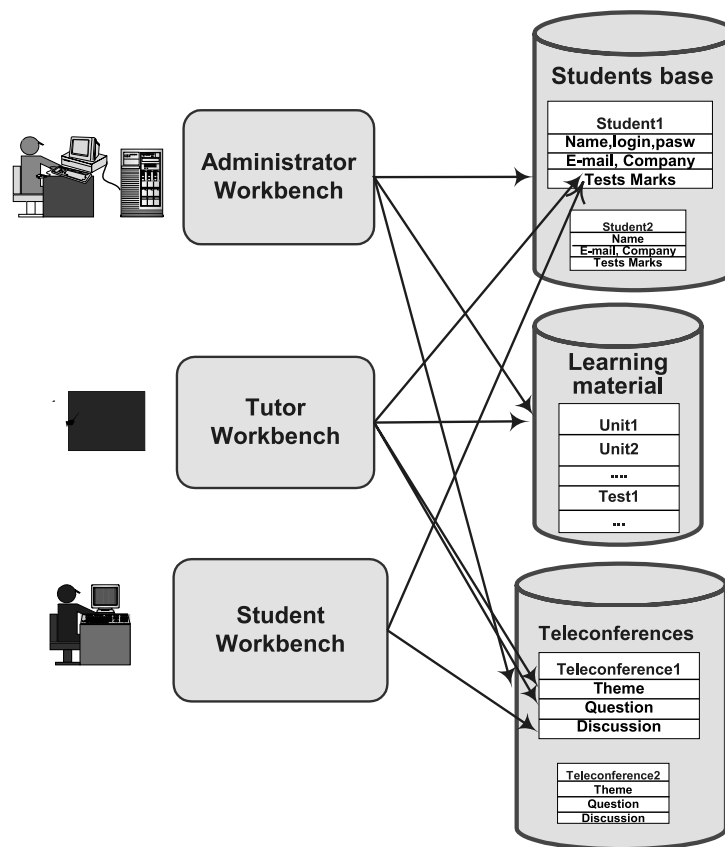


Figure 2: System architecture

## 5 Discussion

The topics of distance education now are widely discussed among researchers, teachers, educationalists and authorities. In some countries DE becomes the item of the national strategy.

But DL-courses development is still more art than science. That is why practical results of any DL-course implementation should be thoroughly examined. The described course on construction management and software system are now on the Web ([www.csa.ru/AI/bm](http://www.csa.ru/AI/bm)) and are under updating and preparing for commercial distribution. The second project aimed at business planning and investment analysis is at development phase.

## References

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