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On the Tools for DLS and SIS Synchronization

(SIS - student information system, DLS - distant learning system)

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Petrozavodsk State University develops and introduces Integrated information an analytic control system (IAIS of PetrSU) for management of instutions of higher education. One of the main tasks of this system is management of academic process.

In recent time more and more instutions look for perspective technological solutions, which can speed up the process the use too give high quality education. They do it using new information technologies and respective telecommunication methods. Distant educational technologies are an in-build part of IAIS and a base for modern technological educational standards.

We can outline the following functional parts of distant educational system.

- Management of academic process
- Development of net learning courses and e-books, which should'n be just digital copies of printed books.
- Management of learning content
- Connection of e-libraries with academic process, which can provide information resources via Internet.
- Planning of academic process.
- Control and assessment of individual knowledge of students.
- Communication in academic process and management.

The solution of items one, five and six is provided by IAIS. The rest is a task of distant learning system (DLS). The most perspective direction of IAIS development is its cooperation with distant educational system of university. This task can be resolved if a new interface for informational exchange between distant educational system and IAIS is develop. IAIS management e-courses in sub systems "management of academic" and "student management". Distant results are traced in sub system "Assessment control".

Interface must meet following requires:

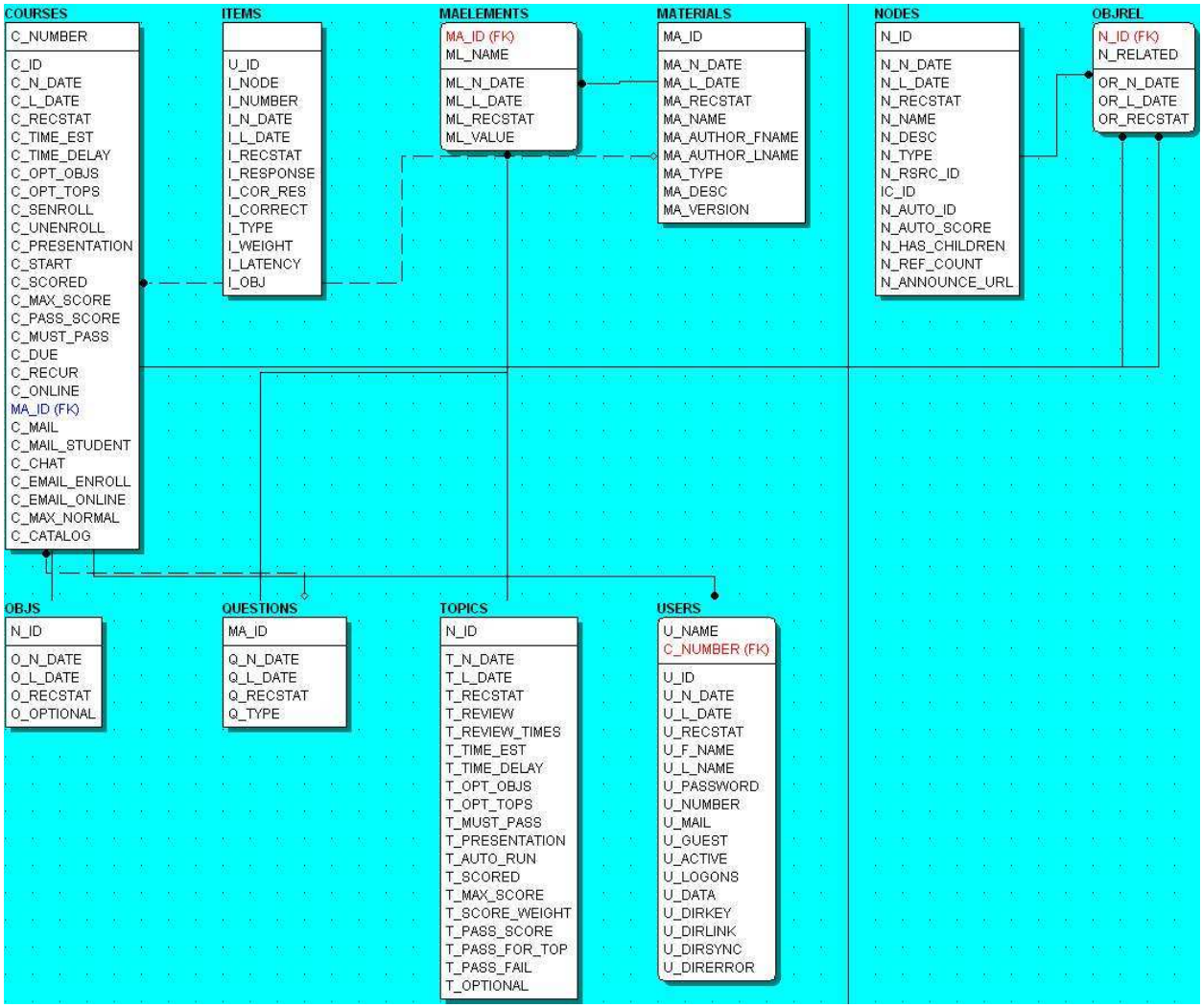
- **To provide access for students registered in IAIS to certain academic disciplines in distant educational system without additional registration.**
- **To provide data verification between distant educational system and IAIS (for example, results of a students distant learning process)**

Currently there is a huge number of software for development and management of distant learning. They most well known are: Lotus Learning Space, WebCT, Blackboard, TopClass, FirstClass.

Any system of high education can be characterized as a system which uses two types of databases in order to keep data and metadata

- **RDBMS**
- **Special database**

The verification task is more simple in the first case because work can be done within the same RDBMS and ideal variant is complete or partial coincidence of date structure:



Lotus Learning Space 5 is an integrated learning system based on web technologies. It a allows to develop, manage and teach courses, manage students registration, trace their results and general reports. Course authors can develop recourses in any standard programs other then Lotus Learning Space.

In order to keep information of system users and courses kept in Learning Space, it uses the following date structures.

When learning space is used as distant education system the development of interface of data exchange with IAIS requires comparison of data structures. For this task we can use methods of data replication or integrated data structures of learning space into IAIS.

In the second case the task is much more difficult because we must now exactly how data structures of distant learning system are represented. This task is sometime impossible, since the software developers do not open source codes.

WebCT is an instrument which allows to develop web based professional learning environment. WebCT presents:

- Interface for courses development
- Learning devices, enabling learning communicational and cooperative possibilities.
- A number of administrative devices which help instructors continually upgrade their courses.

WebCT keeps information with structures is file system. The overall structures looks like this:

- webct
  - name course 1
    - chat
    -*.html, html files used in courses
    - …
  - name course 2
    -
    -
  - ....
  - name course N
- courses
  - database
    - annotation
    - user data
      - list of students
      - user info
      - list of instructors
    - audio
    - course_info
    - glossary
    - goals
    - index
    - questions
      - IMS description of used tests
    - tests
      - IMS description of used tests
    - ….
  - scripts
    - *.pl
    - *.pl
    - …

    Perl scripts, which help instructors in course development.
- users
  - user 1

- info about user
- user 2
-info about user 2
- …
- info about user N

If WebCT is used as a distant learning system for data verification, then, a part from data structures comparison, we should develop software to convert data from IAIS to WebCT files and to interface in order to pick up information of students results for a certain period.

Those in the command case in order to integrate distant learning systems with IAIS it is necessary to develop:

- **A model for cooperation of distant learning system with IAIS. This model must meet requires of international educational technologies standards and technical specification.**
- **XML description of resources , description converter and resources cataloguisation, according to developed model.**
- **API interface which can provide information verification from IAIS to distant learning system and backwards.**