E-LEARNING SYSTEMS

Present e-learning systems are not able to collect, arrange or reuse curriculums, but the expectation for handling platform independent objects is growing constantly.

A reference determines the syntax and semantic of the educational resources' most important attributes is needed for advertising educational services. It gives what kind of attributes an educational resource can have. The best-known specification for it is the Learning Object Metadata (LOM http://ltsc.ieee.org/doc/wg12/LOM_WD5.doc), which is being created by the IEEE LTSC (Learning Technologies Standardization Committee http://jtc1sc36.org/) workgroup.

The undermentioned EES model is proposed by Cloete [E. Cloete: Electronic Education System Model, Computers & Education, 36 (2001), 171-182] for specialists who design e-learning systems as a model of a system which is capable to develop the electronic education's resources during the planning and implementing specific educational situations:

4	**Instructional** (curricula, communication, help, stb.)	
3	**Educational** (authentication, indexing, searching, etc.)	Evaluation
2	**E-paradigm** (synchronous, asynchronous)	
1	**Physical** (hardware and software)	

EES model

As we can see there are in the topmost layer the educational services. We know that it is often problem to find the appropriate service in LANs. Service discovery protocols were developed just for this problem. They make it possible to discover network services in a LAN without configuration in advance and there are also free service discovery protocol standards.

One purpose of our research is to fit service discovery into the EES model to make finding of different educational services easy. Services could be modified dynamically, *discovery* sublayer would trace the changes and indicate them for users.

4	**Complex services (curricula)** - **Services (chapters of the curricula)** - **Discovery** (SA, UA)	**Evaluation**
3	**Educational** (authentication, indexing, searching, etc.)	
2	**E-Paradigm** (synchronous, asynchronous)	
1	**Physical** (hardware and software)	

New EES model

It dictate us to realize service discovery protocol and the educational services have to be described on the score of the LOM standard.

The researching and technological elements have to be realized concretely during the basic research or the applied research are:

- Model for service discovery in education, realizing the protocol

- Research for developing electronic curriculum (e-Book)

- Integrate the e-learning into the conventional education at universities

- Research for methods needed to manage education and production of appropriate services

- To model the student and tutor processes which are needed for reforming and replaning teaching-learning processes, to study and model the new roles (e-Tutor, e-Student)

- To work out online and offline educational forms and to support the management (e-seminar, forum, virtual teacher, consultation, information)

- Content management (real-time, following the standards, lifecycle and process supporting, only for Internet /not media independent/, handling versions, connect the contents, loopback)

- To coach the teachers and students for the new method

- Learning supporting elements

- Curriculum, example collections for independent learning

- To organize and transact online and offline consultations

- Content-connected reference-books with process-planning by the tutor

- Forum

The issues of the research will be applied by the telecommunication department for his own educational tasks. The theme is an important area of our PhD training, we involve also the PhD student of the department into the research and development.

As the issue of our research platform independent e-learning systems can be developed, which are able to collect, arrange and reuse curriculums. Every member of an educational institute will find surely the important information for himself and can get the changes automatically. This information can be anything, e.g. curriculum, class-assignment.

The e-learning system based on service discovery will be worked out by us has advantages for each member of a traditional learning system. It provides curricula for students in their own tempo, verifying the learning of that is dependent upon the student. The information is accessible as a dynamic service. Besides the automatic verification the system lets us to get into contact with the tutor or other students as well as to taking part at e-consultation. It ensures fast information exchange between students and the tutor in both directions using the modern telecommunication technologies.

It solves the curricula management helping for the tutors and helps to check the preparedness of students. Thanks to its flexibility it is suitable for integrate existing systems and makes it easy to apply new services. The system has the offered information in portable manner, because we pay and have paid attention to the e-learning standardization during the research and the development.

In the fight of the educational institutions for students the flexible, personalized training, the dynamic curriculum and specific courses have important role. Another significant function falls on the methods, which targets the so far unreachable groups of students. The more personalized is a course or the more help student gets while learns efficiently and as quick as possible the more possible is that he chooses the institution for his learning lifetime.

Our goal is to create an e-learning system, which has the above mentioned properties based on service discovery and to apply and operate the system in our telecommunication group of department.