Process Based Modeling of Virtual University

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Abstract: - Information society enforces rapid changes in approaches to education its organization and management. New approaches are based on wide use of ICT and all communication is usually established through the Internet. Distance learning removes both space (territory) and time barriers and restrictions of classical presence form of education, and allows distance students to study independently on time. In the contribution there are compared systems of classical and virtual university. Further there is introduced model of virtual university which includes its basic elements, and substantial processes. Further there are defined essential participants (actors, resources) and their roles. Creation of the model is based on Rational Unified Process and on use of UML language and some of its diagrams (Use Case and Class diagrams). The main aim of the model is to quantify, estimate and compare selected economic indicators of Classical and virtual university.

Key-Words: – Virtual university; Modeling; UML; Actors; Roles.

1 Introduction

Effectiveness and quality of study programs which are implemented through distance or combined study form is, according to the experience across Europe, much higher if several Universities set up a common university network. This network is called Virtual University and concerns mainly organizational interconnection among these Universities. This cooperation offers new possibilities for distance students, mainly opportunity to study new and more specific study programs, which they can't find at any University. Main goal of this paper is contribution to the problem of making effective information infrastructure for this kind of cross-university network in the Czech Republic. Such kind of information infrastructure enables effective organization, administration and management of the whole lifecycle of combined and distance form interuniversity study through e-learning

2 Main Stages of Forming Virtual University

Prior to implementation of virtual university there have to be solved several basic problems vitally important for putting the idea into practice.

1 Analysis of existing experience with organization of interuniversity study and analysis of present way of interuniversity administration of on line courses and its problems and disadvantages.

2 Finding substantial processes which fully cover activities connected with organization management and evaluation of the cycle of combined and distance form of interuniversity study through e learning.

3 Support of these processes by adequate information support of the network of collaborating universities in the Czech Republic by creating of distributed software in the form of inserted middle layer application which enables interoperability of existing information systems and effective data integration (sharing and exchange of data in seamless way).

4 Design, implementation, testing, of the application. Created IS infrastructure at collaborating universities will serve as knowledge base for successful stabilization of interuniversity system.

5 Main experience will be transformed into a form of framework methodology for making/ developing of the interuniversity network and its evolution and its spread abroad into selected EU countries

3 Expected Operational and Functional Effects

Setting up virtual university may result into the following effects:

1 Economy and effectiveness of realization of study subjects in both combined and distance.

2   Virtual university will result in common use of all study supports, prevent multiple development similar student support and study materials. In such a way may there be reduced initial expenses for introduction of study subjects supported through e learning. Initial expenses have usually bad influence to the economics orealization of these subjects.

3   Virtual university network and interuniversity study can increase number of students which take part in organized educational activities and courses and in such a way increase effectiveness of the courses. Virtual university provides environment for flexible solution of this problem.

4   Cooperating universities achieve also increasing of quality of study programs and access to attractive study subjects. This will be achieved through concentration and specialization of the staff. At present study programs of universities often overlap in selection of subjects offered. Subjects can't be supervised in many cases by leading specialists in spite of the fact that they were successfully accredited. Consequently they can bring students various profits. Virtual university enables wider use of leading specialist and of their sharing the same subjects. Virtual university can offer better marketing, better quality, wider selection, more adequate of better study support and materials. The study is more interdisciplinary.

5   Virtual university leads to better access to attractive study subject for students coming from various regions in the Czech Republic or EU.

6   Virtual university can promote access and integration into EU and others international inter university structures. Process of making networks has already leads to creation of properly functioning virtual universities and fulfilled expectations which we mentioned in this part of the contribution.

So virtual university is a presumption for sharing of leading EU and other study resources in the form of virtual mobility of students.

4 Advantages of the Virtual University for Target Group (of Students)

Introduction of the virtual university enables for target group of students mainly following advantages.

1 Increasing of quality and attractiveness of offered study specializations and study subjects by universities taking part in the network

a) Sharing all educational activities and events guaranteed by leading and experienced specialists from various universities. Students can choose educational activities adequate their needs through their quality. At the same time are restricted more profitable activities from mentioned point of view. Accompanying information systems promote and stimulate this process by setting rules for natural selection of educational activities at national levels and in such a way tribute to increasing quality of study program.

b) Economy of supported educational activities will lead to the mote efficient concentration of financial and material resources of institutions for supporting quality of educational process and covering of educational needs which include both content and forms.

2 Increasing of possibility of creation individual study plan by selection from substantially wider offer of educational subjects and increasing variety and versatility of educational needs.

a) Mutual and integrated offer of study subjects will result in possibility of selection of individual profile by students with respect to their special needs (with respect to the rules for structure of study plans given by accreditation of various study programs.).

b) Such level of satisfaction of study needs can't be achieved by separate institutions.

3 Flexibility of study as to place and time location

a) Time flexibility is an organic result of combined/distance form of study and e learning. Students can themselves devote study activities time interval which is suitable to their individual time schedule. Time management may lead to higher efficiency in comparison with classical form of centrally made scheduling as it respects individual study conditions and assumptions

b) Student gets potential possibility to study in any place of the world with the access to the internet subjects provided by distant universities (in such a way there is remover space-place barrier).

4 Virtual university leads to better adaptability of alumni in employment in regions.

a) Virtual university removes frequent concentration of university to specific culture, tradition, need of the region they are located in and brings more freedom wider communication through communication with students and university staff from different locations and regions.

b) In such a way are diminished or removed all restriction of region and regional and leads to better adaptability for job in other regions.

Modelling university processes will be made by Rational unified process (RUP) methodology based on UML attitude and its diagrams. This analysis starts by Jacobson Use Cases and

continues by other diagrams. In this contribution we will concentrate to this stage. In presentation will be shown other steps of RUP and other diagrams.

The main purpose of Use case diagrams is definition of interface of virtual university system by defining typical interaction between customer (student) and system of virtual university. Notion actor in use cases represents everything, what comes into a contact with the system. Actor is defined by his roles. By these roles actor comes into a contact with another actors in the system. Interactions between system and Actors we call processes. In Virtual University we can distinguish 8 categories of Actors.

Table 1 Actors and their roles

Role	Description of the Role
Manager	Is responsible for total quality of a study program. Coordinates study program, checks feed back information and makes reports. Chooses proper lectors for a study program. Checks expenditures spend on a program.
Sponsor	Chooses and coordinates team of co-workers working on a modul (more similar to study programs). Can be guarante quality of single programs.
Author	Prepares content (printed materials, documentation, presentations) of a course. Is responsible for quality of provided information.
Mentor	Helps students to solve any problems during whole study, they can give expert information provided on a course. For example helps with building study plan, defines the goals of study.
Tutor	**Roles of Tutor:** Is Author of study materials Is a guide for students on a course and leads students during the study and helps them with reaching the goals of the course. Checks and examines the progress of students during a course. Gives motivation.
Student	Is a participant of a course. His goal is to increase his knowledge and abilities. Student works alone or in a team. He is in a contact with another students and his tutor. For distance students there is necessary to have high motivation.
Administrator	Is a ICT expert, who coordinates preparations of electronic background for distance learning. Defines, develops and validates different components of a learning system.
Opponent	Is an specialist in some field, who checks and evaluates content of studding materials.

Each of these Roles must be included in the model of Virtual University according to its interaction with the system.

5   Conclusion

The Contribution was devoted to very important problem of virtual university, its importance, roles and social importance. The contribution showed first stage of the process of modelling virtual university and its systems using RUP methodology. Further steps of this process will be demonstrated in oral presentation.

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