eUniv - E-Business solution for a university academic environment

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ABSTRACT

Our paper is presenting the 1st version and early evaluation results of *eUNIV*- a re-engineering project for education. The project's objectives are to enhance the university's specific performances and its capacity to manage knowledge. The objectives are to be reached by adapting and implementing a new, modified version of *eyeKNOW,* Wittmann&Partners Computer Systems S.R.L. (WPCS) software for project knowledge management. The e-Business solution is transferred to the university environment. The new product - *eUniv* - is being evaluated in the pilot site of the Department of Computer Science and Automatic Control of the "Lucian Blaga" University of Sibiu. The research-development team consists of professors and researchers from the university and specialists from WPCS. The last step of the project intend to connect to the eUniv server the most important research and documentation centres of the university. The Department of Computer Science and Automatic Control will organize a permanent *show room* for the new product - *eUniv*. The project evolution can be followed up on: www.tele-education.org/eUniv/.

INTRODUCTION

Re-engineering education is very challenging. This is almost a paradox, for professors are promoting the new, new technologies, new management strategies and new methodologies. But when it comes to their style of work, the need to cope with trends is less obvious. We are in the Information Society, working to build the Knowledge Society. One of the desired characteristics of this new society is the power to give access to information and knowledge to all. We are the netizents, we are going on the net everyday and it becomes a reality that we cannot exist without the net. No matter in which area we are working, sooner or later, we are going to work in a network environment, sharing resources over the net with partners from all over the world. In this context it becomes mandatory to master the flux of information and to be able to identify and extract knowledge.

At any time we need to know:

- who is in charge of what
- how to distribute tasks so that all participants to a project be kept informed on the developments and status of the project
- how to link an e-mail or fax to the project and send it to all actors interested
- important events
- what are the steps to follow in order to achieve the standard flux of written information and to distribute it
- Where are preparing the meetings; can the documents be accessed by the participants one day before
- Who's the best at what

and so on.

This is true for all organizations, including universities. We need to know who are the teachers, what are the courses, who is teaching what, who are our students etc. We are communicating inter and intra departments, we are communicating via Internet. In the absence of an organizational environment able to optimize communications, this tend to become chaotic (fig.1)
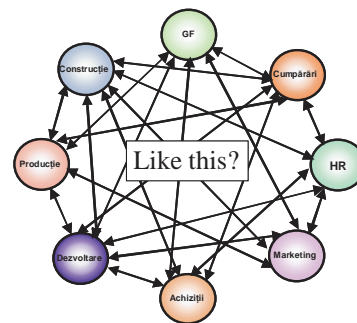

Figure 1.
Communication scheme before eUNIV

In order to solve this problem we have looked to the solutions adopted by business organizations and choose one of them to be the back bone of a new communication flux (fig.2) and not only.
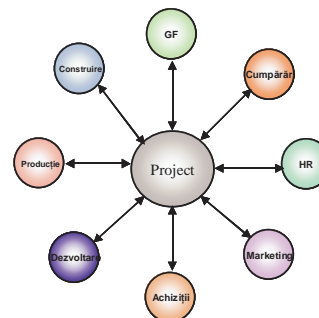

Figure 2
Communication scheme in eUNIV

As a pilot site we choose a department of the university. The logical model is object oriented and project driven.

MATERIALS AND METHODS

The main concept of eUNIV is the project. A project is defined as a set of activities and tasks oriented toward a goal. Resources are allocated to each project. Some projects can share the same resources.

In the 1st version of eUNIV we have considered only five categories of projects:

- ➢ educational (courses, seminars, practical activities, lectures, assessment sessions, graduation and admission, curricula, text-books, e-learning)
- ➢ research (projects: national grants, international grants, co-operation, internal; reports; scientific papers, books; events)
- ➢ administrative
- ➢ secretariat
- ➢ others

For each kind of projects we have designed the corresponding classes, objects and their relationships. In figure 3 we have illustrated some class diagrams. Roles have been used in order to specify the context of a class and its objects. A class can play different roles in different associations. For example, a member of the staff (staff_member class) can play the role of lecturer, researcher, research manager or head of department, laboratory coordinator, technician, administrative director or secretary.

Course
(ID_course, Name_course, Nr_credits, grade)

- create new course
- enroll student
- assessment
- withdraw course

a.

Assessment
(ID-assessment, ID_course, credits, grade)

- create new assessment
- award grades
- modify assesment
- withdraw assessment

b.

Figure 3. a and b
Class diagrams for *course* and *assesment*

eUNIV is a client-server, Lotus Notes Domino application (fig.4). The Domino server is running under Unix. The client platform is Windows 2000.
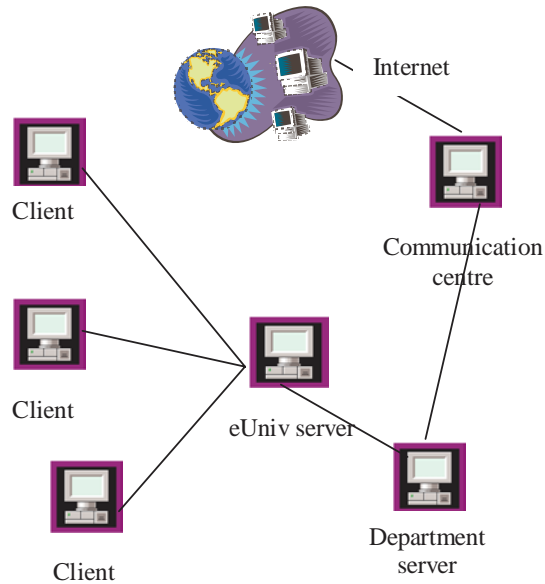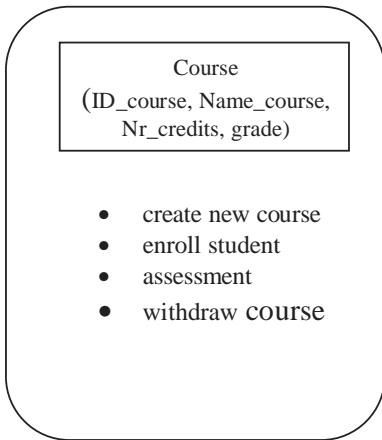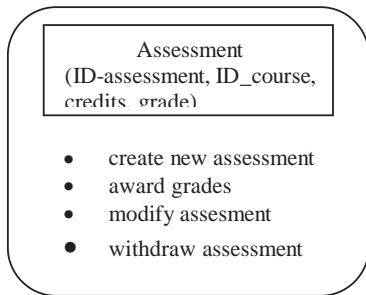

Figure 4.
eUNIV architecture

Each project has a coordinator, a team and resources. For example, the project "Data mining and knowledge discovery in large databases" is an educational project. The coordinator is the professor teaching the course. The team is formed by 2 teaching assistants, the Student4(student in the 4th grade) and a technician. The resources are: human resources, software and hardware, documentation, assessments. For this particular project the available resources are: one professor, two assistants, a technician, a network of PIII, eCache software, statistical software, OLAP demonstrators, a text-book in Romanian, practical work guidelines, references and on-line documentation. This is a minimum acceptable set of resources. If we check with the planned resources we will see that we need one more assistant, assessment tools (online and/or offline) and two networks linked to a powerful server. When the department is preparing the new academic year structure, a software agent is presenting a snapshot of the situation bringing to us the information we need. for example, all professors and assistants specialized in data mining, data mining software available in the department, the configuration of the networks in laboratories and the necessities for data mining practical works, how many workstations we need taking into account the number of hours/student and the number of students in the forth grade etc. Later on, when the timetable draft will be available, the system will provide alternatives for location of courses and practical works. Moreover the agent is checking the pre-requisite for attending the course. For example if the students in the 3rd grade didn't took a course on post relational data bases, they have to attend one before the enrollment to the Data mining course. All these operations being

automatic they provide a valuable support to the department staff.

For the moment we have abandoned the idea of a totally automatic time-table due to the great number of restriction and to their subjectivity. What the system is doing is, once the timetable available, to enable the location of a professor, student or assistant. For example, we can ask eUNIV the question: " Where is professor Smith now? " . The system is checking the timetable for the day and hour and answers: " Room IE101, Faculty of Engineering, lecturing until 9.50" or " Reasearch work. Try his office". We can try also to locate any student and the system will provide us with the classroom location.

The access rights are allocated by the system administrator. There are four categories of access rights: public - anyone can access the information from the web or from a workstation, priority 0 (administrator and head of department), priority 1 - the projects coordinators (access granted to all system information, but some only as read-only), priority 2 - access only to the project information and the ones that are public, of course and priority 3 - access only to administrative and public information. After the first evaluation it is expected that we are going to make the access more flexible, but for the moment we are keeping it like this.

Each project has an agenda, visible by all academic staff, a mail-box, a special mail-box for students and a chat space, where colleagues can start less formal discussions.

The agenda is automaticaly updated by eUNIV. When a new event is announced, the agent is filling in the agendas of those implied. For example, all agendas of the academics have marked the Easter holiday from 1st of May to 12th of May. In the secretary agenda, the holiday will be marked from 1st of May to 7th of May only.

EVALUATION RESULTS

Up to now we have evaluated four complex items:
- server performances
- eUNIV functionalities
- quality of traffic
- eUNIV efficiency

The server performances wetre rated from "good" to "very good", but the quality of traffic was week. This is because we are depoending on the University Communication Centre and as Sibiu is only a point of presence in the RoEduNet network, we have less than 2Mb of debit.

The eUNIV functionalities were rated on average as "good", but the list of extensions is very large. The most important suggestion is to design and implement an agent or spider to crawl on the other university's networks, not only research and documentation centers, and collect relevant information. This, among others, will permit to avoid redundancies at the level of the university. Of course, this imply the involvment and agreement of the other faculties and departments.

The overall efficiency of eUNIV is considered "good" to "very good". It has to be said that we could not yet evaluate all the functions. The management of documents is for sure of a better quality. also the projects' management is improved and in general, information processing takes less time.

One of the week points of the current version of eUNIV is the lack of independance vis a vis the university network. That means that if the university's server is down, we are cut off the world. Several solutions to this problem are under study.

CONCLUSIONS

In his visionary book "*What Will Be How the New World of Information Will Change Our Lives*", Michael Dertouzos, MIT Laboratory for Computer Science director for more than 30 years and science politics maker, has stated that: *The new world of information ...is directly linked to the nuts and bolts of education through the acquisition, organization, and transmission of information and the simulation processes representing knowledge and through the use of approaches like e-mail and groupwork that mediate teacher-learner and learner-learner exchange*. And this is true. The Information Society is changing and will continue to change the world. And we need to acknowledge and accept the change. This means not only to develop new tools, but also new attitudes and work styles. On the Net, we are sharing ideas, opinions, knowledge, experience, resources. Therefore one of the most important lessons learned by the netizens - people of the Net - is the true meaning of the word "*to share*". This is a lesson that all people of the world have to learn for they are or will sooner be users of the Net and their lives will be influenced by what is happening on the Net. Education has to be the driving force, the one that catalyses and enables that all these changes take place in a natural, non-traumatic way.

We have presented a software application - eUNIV- for re-engineering an educational organization, based on a business solution - eyeKNOW - developed for knowledge management in an enterprise. The functionality of eyeKNOW has been extended to fit the requirements of an academic environment. The pilot site is a department of the faculty of Engineering. The first evaluation results have shown first of all that the solution is a feasible one. That means that strategies applied to optimize the overall activities in a commercial organization can be successfully applied, after customization, to an educational environment. The eUNIV system enables not only a better management of all kinds of documents and projects, but it is an environment that allow educational staff to adapt to a new style of work: to share resources, projects, to cooperate without frontiers, in an organized and structured way. The pitfalls of the system are those of all attempts to standardization.

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