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STATE AND PERSPECTIVES OF INFORMATION SYSTEM “STUDENT” AT THE TECHNICAL UNIVERSITY OF KOŠICE, SLOVAKIA

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ABSTRACT

The paper describes functions of pedagogic information system (IS Student) and presents vision of new pedagogic information system as a part of complex solution of university information system. Present system involves all faculties and is based on modern technologies (SQL, client/server architecture, WWW interface). Due to increasing requirements of the users we decided to redesign pedagogic information system. Based on more than six years experience of the maintenance of the system, it gives us imagination, how to cover all information needs of academic community of the Technical University in Košice. The paper gives a brief characteristics of the modules of the integrated information system of the Technical University in Košice which, except the maintenance of the IS STUDENT, are the subject of our study with an effective cooperation of users. It outlines the use of modelling tools and realization of project aims consisting of new PIS generation.

1. INTRODUCTION

Technical University Košice (<http://www.tuke.sk>) was established in 1952. It consists of 8 faculties with about 12 thousand undergraduate full-time students and 700 postgraduate students. The university employes about 900 university teachers, similar number of research workers and technical-administrative staff. It belongs to one of few universities in Slovakia running a pedagogic information system at all faculties.

The main objective of the pedagogic information system PIS IS Student is to achieve the maximal effectivity of administration activities related to provision of pedagogic process at the university. It is used by study officers, students, teachers and also by lodging officers.

However, the IS STUDENT at the university has not been done in accordance with professional principles for development of information systems. The most of individual IS parts were developed and pushed forward from the level of programmers and developers. Even if the management of the university or individual faculties declared their support to development of informatics, it was not

willing (and sometimes also not professionally prepared) to assist by development and realization of conceptions which might improve the information systems [4]. The system has not originated after a detail specification of requirements of individual users. Its functionality was widened gradually and it was recorded insufficiently. This approach was negatively reflected by internal system architecture resulting in relatively problematic integration of some requirements into the system at the moment.

Based on more than six years experience with development and operation of the IS STUDENT, as well as processing of requirements of the system users, we decided to develop a new pedagogic information system (PIS) at the beginning of 2001. The system should fully meet all needs of academic community at the Technical University of Košice.

2. THE CURRENT IS STUDENT

The development of IS STUDENT commenced in autumn 1996, when individual systems STUDENT and APPLICANT, covering the agenda of study departments and originally written in dBASE system, were reworked in the environment of database system Ingres. In 1998 the development and testing of web applications of IS STUDENT started and was designed for university students and teachers. It was followed by their full application in the autumn semester 1999/2000.

At study departments of individual faculties and residential halls 36 database clients (28+8) are installed. 779 teachers (30829 visits) and 8423 students (94230 visits) used the web applications in year 2001. The maximum system permeability in year 2001 was 7034 queries per hour.

2.1. Functional decomposition of IS Student

IS STUDENT at the moment consists of 3 time and relation interlocked subsystems "Applicant", "Student" and "Lodging".

1. **Subsystem Applicant** covers the entire process of entrance procedure at university - registration of data according to the applicant application form, generation of the data base for entrance interview (division on terms and rooms, processing of scales according to criterion for acceptance without entrance interview, formations for result registrations, printing of envelopes, address labels, invitation cards and rescripts), processing of entrance and appellation procedure results (results collecting, generation of various outputs), statistic processing concerning accepted applicants for Ministry of Education of the Slovak Republic and others (processing of return slips).

The application is used by study officers of individual faculties of TU Košice.

2. **Subsystem Student** covers all basic activities of study departments concerning processing student data during his/her study at university.

The client application is used by study officers of individual faculties for processing of student personal data, registration of subjects (it represents work with study plans and following registration of subjects collectively and individually), evaluation of study, statistic overview (according to faculty requirements as well as Ministry of Education it is possible to do statistic overview in various divisions, reports for insurance companies), services (they contain possibilities as monitoring of loans, possibility to divide class into groups, parallel units, retirement of graduates (collectively), progress of all students in one class (with choice possibilities), collective retirement of students, specialization choice, transfer of undone subjects from the last school year) and others (printing of various lists)

The web application serves to teacher for publishing of exam dates and exam evaluation (registration of exam results may be done at study department from exam reports or by teachers through web application). Students may subscribe for exam on-line.

3. **Subsystem Lodging** serves to lodging and study officers mostly. It includes registration of lodging application, support of decision process on lodging assignment (point evaluation, printing of various lists), decision procedure on lodging assignment and printing of decision of lodging assignment, registration of lodged persons (access to list of lodged persons on Internet), final decision registration and others (printing of various lists).

2.2. Technical maintainance of IS Student

IS Student uses modern technologies (SQL, client/server architecture, WWW interface). It is built on the relation database system CA-OpenIngres 2.0 and WWW server XITAMI. The used script language is Webin Tool. The server of IS Student is a computer having two Pentium III (2 x 800 MHz) processors and Windows NT 4.0 operation system.

The database clients work in the operation system Windows 95/98. WWW browsers compatible with HTML 3 standard are supported. Communication by SSL is required.

2.3. Contribution and shortage of IS Student

Contribution of IS Student :

- increasing effectivity of performing of the most of the administrative activities which were performed so far by the study departments staff, teachers, managerial workers and students so far
- increasing computer literacy of student and teachers
- implementation of rules for keeping terms and processes related to the IS STUDENT
- unloading of study department staff from duplicity works, removing of stress situation
- more precise registration of students' data
- fast access to data in real time
- existence of archive and actual databases

The reasons for generation of a new pedagogic information system were:

- difficult incorporation of new requirements on system, which is related to the absence of a complex system model
- insufficient documentation hampering or restrains maintainance and evolution of the system
- continuously increasing requirements on widening of system functionality
- requirements on increasing safety of the system
- requirements on on-line interlink of the system with other neighbouring university systems
- the absence of technical support of development tools
- difficulties with financing of necessary upgrades of Ingres database server
- GUI - unification of work with various printer types and opening of perspective for wider cooperation with other programme applications (substitution of alphanumeric presentation by entire GUI application in client application)
- dependence on "life and death" of an author [5]

3. PERSPECTIVES OF IS STUDENT = A NEW PEDAGOGIC INFORMATION SYSTEM (PIS)

Problems with incorporation of new requirements into system and continuously increasing requirements for improving of system functionality resulted in decision to generate a new parametric PIS. The project commenced in January 2001 and its termination is planned to December 2002. Five people have been currently working with the project who also maintain operation of IS Student (in the second half of the year at least three more people should be involved into the project). The aim of the PIS generation project is particularly detail documentation of user requirements on the system, creation of a complex system model using UML language (Unified Modelling Language) and implementation of PIS.

Basic requirements of the system [8]:

- properties - modularity, distribution, complexity, flexibility, demonstrativeness
- client-server architecture
- differentiated approach to the system
- friendly environment for users
- cooperation with neighbouring IS
- organization provision of PIS operation at individual faculties
- support of university management and faculties

3.1. Proposal of moduls for new PIS

We assume that a new pedagogical IS will be an open modular system with possibility of flexible integration of new architectural elements. According to our experience gained during development and running of IS STUDENT an integrated educational information system, which should cover all needs of academic community of the Technical University in Kosice, should include following basic moduls (Fig. 1.) :

- 1 **Entrance procedure** - registration of applicants, entrance process, publication of entrance exam results, possibility of pre-registration of applicant through Internet, support for data generation and evaluation of tests for entrance interview etc.
- 2 **Student's Personal data** - registration of student's personal data which will be transferred from the modul Entrance procedure, student activities and related statistics.
- 3 **Study processing** - registration of events as for example acceptance of student for study, repetition of class, interruption of study, finishing of study etc.
- 4 **Educational process** - a complex view on educational process from registration and publication of information on subjects offered in programmes (module **Courses (Subjects)**), generation and publication of study programmes (module **Study plans**), information on free rooms, labs, special rooms for education (modul **Rooms**), educational information on teachers (modul **Teacher's data**), registration for individual subjects and class projects (module **Pre-registration**), support of time schedule suggestion (module **Time schedule**), registration of attendance, credit process controlling and exams (module **Study evaluation**), monitoring of the entire process concerning thesis and state exams (modul **Thesis and state exams**).
- 5 **Residential halls** - processing of lodging assignment and registration of lodged persons.
- 6 **Payments and scholarships** - registration of scholarships, loans, tuition fees etc.

- 7 **OLAP** - access to required data and statistic overview for faculty management and chancellor office.
- 8 **Public** - to ensure anonymous access to all public information according to the valid legislation.
- 9 **Graduates** - information about Technical University graduates, registration of sponsor activities of students in relation to faculty or university.
- 10 **Security, Access rights, Maintenance and Relationship** - it is assumed that their functionality are spread through the entire system, therefore they are depicted in Fig. 1 separately from other moduls.

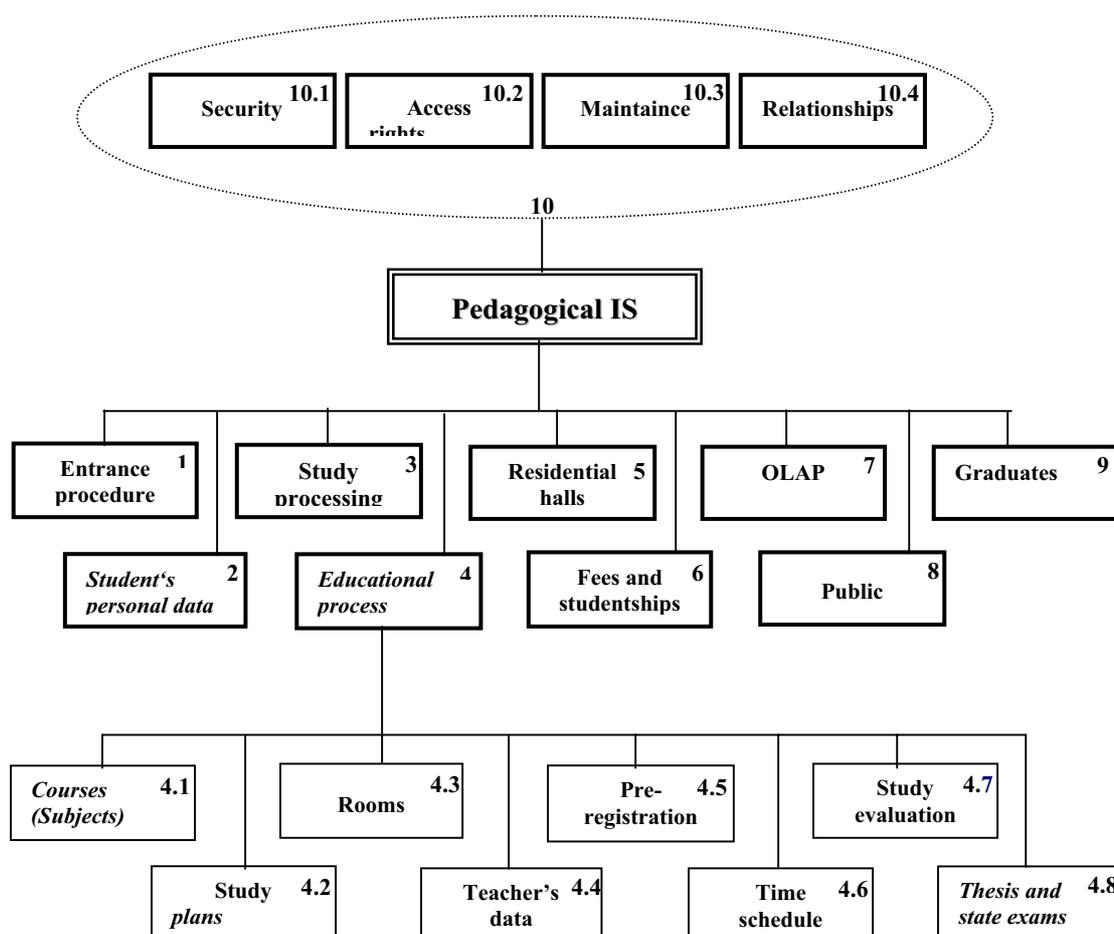


Fig. 1: Moduls of PIS

3.2. Global access rights

Accessible rights may be given implicitly (the rights are given to other users by hierarchic application system) or explicitly (the rights are given on the base of conditions defined the system). Schematic table of access rights (Tab. 1) gives an overview on access of users to individual moduls of pedagogical information system.

Moduls of PIS	USERS							
	A	S	T	M	SO	LO	P	G
1. Entrance procedure	x			x	x		x	
2. Student's personal data		x	x	x	x	x		
3. Study process		x	x	x	x			
4. Educational process								
4.1. Courses (Subjects)	x	x	x	x	x		x	
4.2. Study plans	x	x	x	x	x		x	
4.3. Rooms	x	x	x	x	x		x	
4.4. Teacher's data		x	x	x	x		x	
4.5. Pre-registration		x	x	x	x			
4.6. Time schedule		x	x	x	x			
4.7. Study evaluation		x	x	x	x			
4.8. Thesis and state exams		x	x	x	x		x	x
5. Residential halls	x	x		x	x	x	x	
6. Fees and studentships	x	x		x	x	x	x	
7. OLAP				x				
8. Public	x	x	x	x	x	x	x	x
9. Graduates				x	x			x

Tab. 1: User access rights (A-applicant, S -student, T- teacher, M - management, SO - study officer, LO - lodging officer, P - public, G -graduate).

3.3. Modelling of PIS

During operation and maintenance of the information system "Student" we face many problems related to absence of complex system model. During generation of the new pedagogic information system we have tried to use modelling tools as much as possible. We expect that correct and thorough use of modelling provides [4]:

- simplification of communication among individual teams participating in project and mainly communication with user
- early error detection and elimination
- possibility of automation for transition from some models or their parts to implementation (generation of scripts, source texts and patterns based on models)
- maintenance of system documentation at higher abstract level based on models
- the use of models for administration and maintenance of the running system .

The convenience of the UML language use (UML - standard modelling language for visualisation, specification, construction and documentation of software systems) was verified during the modelling of the model "Entrance procedure" (Fig. 2).

From the practice we know how important role is played by the data and process model in the life cycle of the software system. From this reason we have devoted them increased attention.

3.4. Platform

We have decided to use an operation system LINUX and DBMS INFORMIX on the server side for development of a new PIS and MS Windows 95/98/2000 and standard www browser on the client side. The development environment for client application is represented by C++Builder. For web applications we assume the use of PHP or Java.

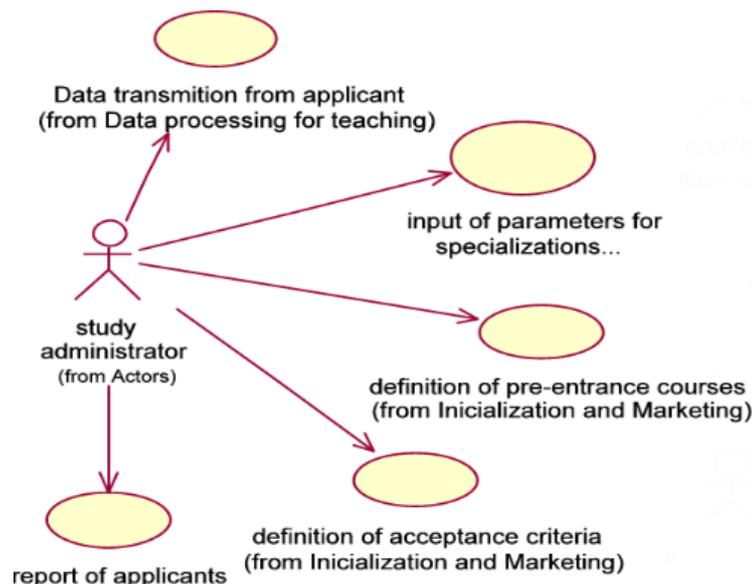


Fig. 2: A part of USE CASE diagram "Entrance procedure" .

3.5. What next?

Until the end of 2002 according to the aims of the project we would like to finish:

- the specification of requirements on pedagogic IS (in description form and in graphic form by UML)
- typical logic data model of the system
- typical process model of system
- proposal and definition of PIS monitors
- realization of typical PIS.

We plan to publish the results of the project in electronic and printed form in order to access it at least to Slovak academic community.

4. CONCLUSION

The experience with present application of IS Student and, above all, implementation of user requirements resulted in a need of redefinition of current application. It was decided to develop a new pedagogic information system, which would cover almost all need of academic community at the TU Košice. We have presented a global view on the system. PIS moduls are briefly described. During the development of a new PIS we put an emphasise on processing of requirements analyses in the sense life cycle of software system. It represents the widest use of modelling tools, especially UML language. It is still open whether also other diagrams UML should be used during documentation (besides used UCE CASE and CLASS diagrams), e.g. activity diagrams and interaction diagrams. The processing of the data and proces model is obvious. So far the modul "Entrance procedure" is completely processed both from the analytic and programming view (in C++ Builder environment). They include transfer scripts for data transfer into a new data structure. We expect a shift to a new database server Informix under Linux as well as processing of other proposed PIS moduls analogically

as we processed the modul "Entrance procedure". After termination of the project we would like to publish project results in electronic and printed form at least for the Slovak academic community.

REFERENCES

- [1] GENČI J. ET AL. (1996). Contemporary database systems. Technical University Košice, Slovakia
- [2] HAVLICE Z. ET AL. (1996). Information system Pegas. Technical University Košice, Slovakia
- [3] TSICHRITZIS D.C. AND F.H. LOCHOVSKY (1977). Data Base Management Systems. Academic Press, USA
- [4] HAVLICE Z. (1998). Modelling and prototyping in project management and development of information systems. Publishing Elfa, Košice, Slovakia (in Slovak)
- [5] TÓTHOVÁ H. AND Z. ROHÁČ, M. KOVÁČIK (1997). Information System Student at Technical University of Kosice - Disappointments and Chances, UNINFOS 2000, Slovakia (in Slovak)
- [6] VRANA I. AND J. BUŘIL, A. ČERNÝ (1999). The methods of applications of information systems at universities. VUTIUM Press, Brno, Czech Republic (in Czech)
- [7] ROHÁČ Z. AND G. JANOČKOVÁ, P. ŠUTOR, H. TÓTHOVÁ, Š. KLEIN (2001). Requirements on Pedagogic Information System in object oriented optics, UNINFOS 2001, Zvolen, Slovakia (in Slovak)
- [8] FEI STU AND CVT STU, ÚVT ŽU (2000). Information System Education, Project proposal of processing of program system, Bratislava, Slovakia (in Slovak)