

*e-learning platform, knowledge distribution,
tools and software*

Tomasz PARA^{*}, Jan PIECHA^{*}, Paweł PAWEŁCZYK^{*}

THE E-CONTENT DISTRIBUTION PLATFORM FOR INTERNET VIRTUAL UNIVERSITY SERVICES

The e-content development methods are the most important task that has to be solved for electronic lessons implementation. The second important work that has to be done concerns data files distribution for eligible users of an Internet education resources database. These demanding solutions are integrating different levels and different technologies of programming. The paper describes several aspects of an Internet e-content databases structure and services needed for their content distribution, using high level Internet resources protection standards.

1. INTRODUCTION

The paper shows number of services needed to use the Internet data units on a remote terminal. The database complexity implies demanding interfaces that make exploration of the database content possible, using questions – explorer. The discussed problem concerns already evaluated project, used for Distance Learning System exploitation, by an Internet service.

The multimedia applications use various graphical interfaces and rich formats of graphics, animation and various audio effects. Although many efforts have already been done on this field new challenge one can observe that provide the Internet application [1], [2].

2. THE DISTRIBUTION PLATFORM MAIN UNITS

The research worker unit

Every research worker can use his own website containing personal data (e.g. the e-mail address, the work schedule, the list of research works, the picture, etc). Some of these data components are accessible for any visitor, but some of them are available for logged-in students only. The front page used by the research worker creates a system administrator.

The system administrator also creates specific login and password for each research worker that allows entering the system. Modifications require web browser usage (e.g. Internet Explorer). Anyhow our product provides the user with interface avoiding script or hyper text languages (e.g. PHP, JavaScript or HTML) usage. Just new values in data fields have to be typed.

The research worker's authorization

In case you want to access options available for research workers only enter the system first. Then use your login and password - given to you by the system administrator:

^{*} Department of Computer Systems, University of Silesia, Poland

- run the web browser and put the main page identifier,
- then a login window appears (Fig. 1):

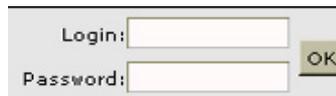


Fig. 1. Window for login

- after properly given data the user is logged-in the DL system (Fig .2)



Fig. 2. The Logged research worker

Options available for the research worker

When the worker is already logged-in several options are available:

- personal data,
- published books and papers,
- consulting schedule,
- mail,
- a student score file.

All this options available in bookmark Research worker, in direct modification mode (none programming skills needed).

The user personal data

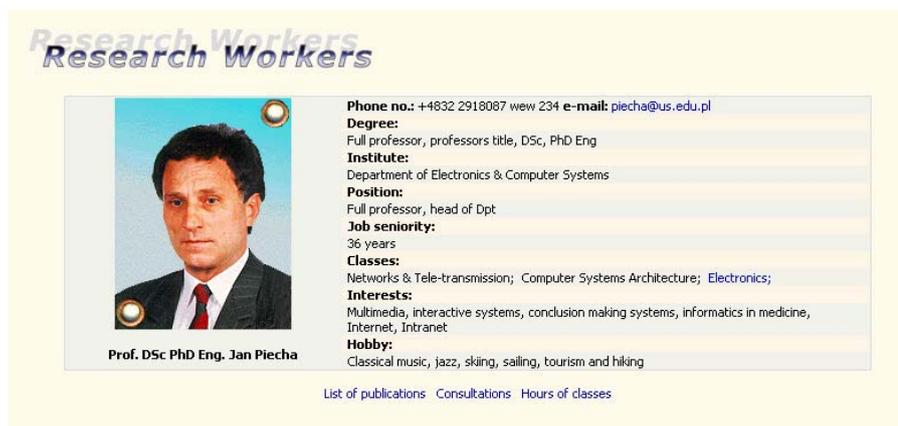


Fig. 3. Research worker's main page

Fig. 3 shows an example of the front page where modifications has to be done (after you are logged-in). The worker's editing interface has been presented in Fig. 4.

Editing personal data	
Name and surname:	Jan Piecha
Login:	jan
Password:	***
Confirm password:	***
Degree:	Prof. DSc PhD Eng.
Research position:	Full professor, professors title, DSc, PhD Er
University position:	Full professor, head of Dpt
Institute:	Department of Electronics & Computer Systems
Phone no.:	+4832 2918087 wew 234
Mobile phone:	
E-mail:	piecha@us.edu.pl
Year of employment(yyyy):	1967
Interests:	Multimedia, interactive systems, conclusion making systems, informatics in medicine, Internet, Intranet
Hobby:	Classical music, jazz, skiing, sailing, tourism and hiking
Present picture:	
Picture (max. 100 kB):	<input type="text"/> Przeglądaj...
Classes:	<input type="checkbox"/> Public Administration <input type="checkbox"/> Algebra <input type="checkbox"/> Algorithms and Data Structures I <input type="checkbox"/> Mathematics analysis <input checked="" type="checkbox"/> Computer Systems Architecture <input type="checkbox"/> Operational Research
<input type="button" value="Send"/> <input type="button" value="Clear"/> <input type="button" value="Cancel"/>	

Fig. 4. The research worker's edit form

- characters editing,
- worker's picture replacing,
- login and password modification.

The research workers file of publications,

The list is grouped in two roots:

- *type* (as: journals, monographs, books, handbooks, ...)
- *subject*

Extending the file:

- mail,
- choose the *Research worker->Publication* from the menu (look at the example in Fig. 5).

List of publications	
periodical	
1. Systemy CAI	
2. Transitions modelling for digital objects	
Subject: <i>Computer Based Learning and Simulation Techniques</i>	
3. Multilevel model for microcomputer ICAI system	
4. CAEE systems design principles	
5. The interactive CAL resources and multimedia databases development	
6. Remarks to CAL systems design	
7. CAL systems implementation within Authorware Professional	
8. The CAI microcomputer system. Some problems with strategy and memory reduction	
9. Authoring system the interactive visual interface	
10. The conversation shell implementation for cal systems under authorware professional	
ADD PUBLICATION	

Fig. 5. The worker publications file

To append a new item to the list choose an interface *Add publication*, as shows the example in Fig. 6.

Add new publication	
Select type of publication:	<input type="text" value="periodical"/>
Give names of authors, e.g.: Kowalski J., Malinowski W. (Do not forget about comma)	<input type="text"/>
Give title of publication:	<input type="text"/>
Give others informations (e.g. year, ISBN):	<input type="text"/>
Select subject of publication from the list or give a new one or leave empty:	<input type="text" value="No subject"/>
Download publication (PDF file):	<input type="text"/> <input type="button" value="Przełóżaj..."/>
<input type="button" value="ADD"/> <input type="button" value="Cancel"/>	

Fig. 6. The interface for file modification

Choose type: journals, monographs, books, handbooks. Then type a name (or names) of author(s). The default format has to be used: *surname space first letter of name dot*.

Ex.: Smith M.
or Smith M., Doe J., Peggy S.

The editing is permitted for person who entered the data into, only. For more, please check the system options. The *Add* button confirms the editing process. *Cancel* exits without saving changes.

Consulting schedule

A new list editing

Choose the *Research worker -> Consultation* option. The default list appears that can be modified using the interface presented in Fig. 7, where: day, week, time, place, type and actions are defined.

After the data is replaced the *Update* button will set the data into the website database. The edited, current data is canceled by *Delete* button. After the consulting record is accepted, by at least one student, it can not be removed.

List of duties							
No.	Day	Date	Begin	End	Room	Type	Actions
1	<input type="text" value="Monday"/>	<input type="text" value="every week"/>	<input type="text" value="14.00"/>	<input type="text" value="16.00"/>	<input type="text" value="B-307"/>	<input type="text" value="Consultation"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
2	<input type="text" value="Monday"/>	<input type="text" value="every week"/>	<input type="text" value="10.00"/>	<input type="text" value="11.30"/>	<input type="text" value="B-320A"/>	<input type="text" value="Diploma seminar"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
3	<input type="text" value="Wensday"/>	<input type="text" value="every week"/>	<input type="text" value="11.00"/>	<input type="text" value="13.00"/>	<input type="text" value="B-320A"/>	<input type="text" value="Consultation"/>	<input type="button" value="Update"/> <input type="button" value="Delete"/>
4	<input type="text" value="Monday"/>	<input type="text" value="every week"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="Consultation"/>	<input type="button" value="Add"/>

Fig. 7. The consulting schedule

Registration student list

After the students put their names into the list it is presented at the website (Fig. 8):

Consultations waiting list		
Monday (03.06.30) - hrs 14.00 - 16.00 Consultation		
No. of index	Name	Confirmation
11078	Kwiecień Igor	<input type="checkbox"/> Message
<input type="button" value="Confirm"/>		
Monday (03.06.30) - hrs 10.00 - 11.30 Diploma seminar		
No. of index	Name	Confirmation
11078	Kwiecień Igor	<input type="checkbox"/> Message
<input type="button" value="Confirm"/>		
Wensday (03.07.02) - hrs 11.00 - 13.00 Consultation		
No registration		

Fig. 8. The consulting students' file

The teacher is in duty to confirm the consulting schedule to every student. Any additional information can also be sent to the student (fig. 9). The *Send* or *Cancel* buttons are used for messages transfer.

Write the body message:

Fig. 9. The message window

Messages for lab-groups

The laboratory group example is given in Fig. 10.

List of students group				
Major	Type	Year	Group	Send
Informatyka	Dzienne 3-Letnie Wyższe Studia Zawodowe - licencjat	2	A	Message
Informatyka	Dzienne 3-Letnie Wyższe Studia Zawodowe - licencjat	2	B	Message
Informatyka	Dzienne 3-Letnie Wyższe Studia Zawodowe - licencjat	2	C	Message
Informatyka	Dzienne 3-Letnie Wyższe Studia Zawodowe - licencjat	1	A	Message
Testowa - elektronika	1 - semestralne testowe	1	A	Message

Fig. 10. The laboratory group

The interfaces for messages transfer uses the *Send* and *Cancel* buttons in the same manner as for single student.

Browsing student's score

If you are a teacher of group using a MAMS, you are able to browse the student's score. Choose the *Research worker ->Study scores* option then a list of subjects for browsing (Fig. 11) is available.

MAMS supported subjects	
Electronics	lists of laboratory groups
Computer Systems Architecture	lists of laboratory groups

Fig. 11. The list of subjects

Choosing the subjects you are interested in and get a list of students, as in Fig 12.

Lists of students who passed tests		
Student Id	Name and surname	Action
181711	Paweł Kępiński	Test score
987654321	Roman Testowy	Test score
181754	Wojciech Zakowicz	Test score
181757	Łukasz Żbikowski	Test score

Fig. 12. The list of students

After the student is chosen the score list will appear (Fig 13).

Student's index number:		181757					
Name:		Łukasz					
Surname:		Żbikowski					
Name of academic year	Science	Beginning year	Kind of studies	Deanery group	Semester		
ST001	Test - electronics	2002/2003	testing studies - 1 semester	A	2		
	Pos.	Date of beginning test:	Hour of beginning test:	Date of end test:	Hour of end test:	Scores(%)	Details:
	1	3-June-2003	12:28:44	3-June-2003	12:37:50	83	More >>>
	2	3-June-2003	12:39:11	3-June-2003	12:50:13	37	More >>>

Fig. 13. The list of scores

If more details are needed click *More*, then the result is presented as in Fig. 14.

Student's index number:		181757					
Name:		Łukasz					
Surname:		Żbikowski					
Name of academic year	Science	Beginning year	Kind of studies	Deanery group	Semester		
ST001	Test - electronics	2002/2003	testing studies - 1 semester	A	2		
Start date	3-June-2003						
Start time	12:28:44						
End date	3-June-2003						
End time	12:37:50						
Scores (%)	83						
Id qu.	Scores.	Level	Rep.	Start date	Start time	End date	End time
22	75	2	0	3-6-2003	12:33:15	3-6-2003	12:34:25
22	75	1	1	3-6-2003	12:35:30	3-6-2003	12:36:38
22	100	1	2	3-6-2003	12:37:04	3-6-2003	12:37:49

Fig. 14. Extended score-formats

STUDENT

The student ready to study in our Virtual University obtains from the system manager the access permissions to DL system database. This procedure goes through several options (from the list below Fig.15) that have to be completed by the student: Home page, Study course, Obligatory Subjects, Additional Subjects, MAMS unit import, consulting services.

After the data is replaced the *Update* button will set the data into the website.

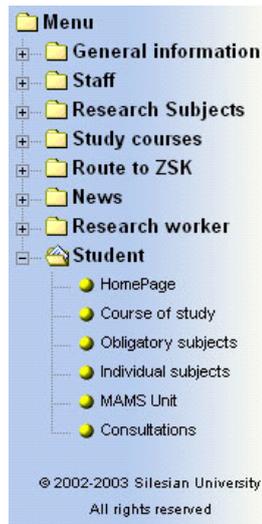


Fig. 15. The main menu STUDENT

The student's home page

The information about the studies content is given in the specification, as in example bellow (Fig. 16).

Student's page					
Number of student's index	11078				
Name:	Igor				
Surname:	Kwiecień				
Schedule name	Kierunek	Year of begin studies	Kind of studies	Deanery group	Semestr
ST001	Computer Science	2001/2002	Bachelor studies - 3 years	A	4

Fig. 16. General information

The website of DL system contains information that sent to the student the dean's office. Any new information is presented automatically during the student's activity. The Dean's office is spotting the messages reading.

The study monitoring

This option provides the user with various data components that are the evidence of the student activity (Fig.17).

Information about course of study					
Number of student's index:	11078				
Name:	Igor				
Surname:	Kwiecień				
Schedule name	Direction	Year of begin study	Kind of study	Deanery group	
ST001	Computer Science	2001/2002	Bachelor studies - 3 years	A	
Information about course of study					
Dopuszczenie do semestrów					
Sem. 1	Sem. 2	Sem. 3	Sem. 4	Sem. 5	Sem. 6
<input checked="" type="checkbox"/>					
Pass semestry					
Sem. 1	Sem. 2	Sem. 3	Sem. 4	Sem. 5	Sem. 6
<input checked="" type="checkbox"/>	<input type="checkbox"/>				
Attentions					
info nowe					

Fig. 17. The interface of student activity

Obligatory subjects

Defines the list of obligatory subjects needed to fulfilling the study schedule. Clicking on an active link, in the title of the subject, full information about the subject is given (Fig.18).

Additional subjects

There is a list-defining subject set that completes the study course into previously defined total score. When the student makes tests within the applications using a MAMS platform, the results of interactions are registered and presented (Fig.18)

Student's index number:		181757				
Name:		Łukasz				
Surname:		Żbikowski				
Name of academic year	Science	Beginning year	Kind of studies		Deanery group	Semester
ST001	Test - electronics	2002/2003	testing studies - 1 semester		A	2

Pos.	Date of beginning test:	Hour of beginning test:	Date of end test:	Hour of end test:	Scores(%):	Details:
1	3-June-2003	12:28:44	3-June-2003	12:37:50	83	More >>>
2	3-June-2003	12:39:11	3-June-2003	12:50:13	37	More >>>

Fig. 18 The MAMS check-up results

Consulting services

The system provides the user with remote enrolling into consulting services – given by university workers (Fig. 19). Every proposal has to be confirmed clicking the *Confirm* button. For killing the record the *Delete* button is used.

30	Thursday	PhD Eng. Jarosław Zyguła	03.07.10	11.00 - 15.30	B-410	Przyg. prac magisterskich	<input type="button" value="Sign"/>	
31	Thursday	DSc PhD Eng. Wiesław Kotarski	03.07.10	10.00 - 13.00	Ż	Deanery	<input type="button" value="Sign"/>	
32	Thursday	MSc Iwona Kostorz	03.07.10	13.30 - 15.00	B-08	MSc Workshop	<input type="button" value="Sign"/>	
33	Thursday	PhD Eng. Maciej Bargielski	03.07.10	10.00 - 12.00	B-323	Consultation	<input type="button" value="Sign"/>	
34	Thursday	MSc Jarosław Pyszny	03.07.10	11.00 - 12.00	B-322A	Consultation	<input type="button" value="Sign"/>	

List of consultations that you are already signed up for								
Day	Date	Hours	Lecturer	Room	Type	Status	Delete	
Monday	03.07.07	14.00 - 16.00	PhD Piotr Porwik	B-302	Diploma seminar	Unknown	<input type="button" value="Delete"/>	
Monday	03.07.07	14.00 - 15.30	DSc PhD Eng. Wiesław Kotarski	B-320A	MSc seminar	Unknown	<input type="button" value="Delete"/>	
Monday	03.07.07	10.00 - 11.30	Prof. DSc PhD Eng. Jan Piecha	B-320A	Diploma seminar	Unknown	<input type="button" value="Delete"/>	

Fig. 19. The interface for consulting services

DEANERY

Virtual deanery interfaces are provided for studies arrangement and management, via Distance Learning Platform services.

Options: students services, the DL Platform users registering and administrating, setting the users privileges for DLP resources usage, a teaching resources and study structure selection.

The unit was designed as a Virtual Deanery available from Internet terminals.

The deanery options allow providing students with services common for traditional study organisation. The database of Virtual Deanery is arranged in a way of tree. Anyhow the user has to edit and update his data record systematically.

Available options

Administration Panel (below) is available after the user was logged-in

Administrative Console			
Server: Master Server DL (155.158.112.162)		Wersja polska	
User: Virtual Deanery (dziekanat)		Change password	Logout
Free space at WWW directory: 1334.03 MB			
Units			
No	Name	Description	Actions
1	Groups	Groups editor	Run
2	Laboratory groups	Experiment laboratory groups	Run
3	Menu	Menu editor	Access denied
4	Dean's office	Virtual Dean's office	Run
5	Pages	Pages editor	Access denied
6	Research workers	Research workers editor	Run
7	Subjects	Subjects editor	Run
8	Students	Students editor	Run
9	Studies	Studies editor	Run
10	Message Center	Communication with students	Run

Fig. 20. Administration Panel

Deanery services

First, very useful keywords dictionary that simplifies needed names searching, in following fields of the record:

The study branch, The study form, Year of the course, Subjects support by MAMS (with e-learning resources).

The study branch (Studies)

It is the unit that support creating the study program; setting duration of the study, selecting courses program, getting information about available subjects and other necessary parameters.

Studies						
Study start/Course/Study level (Specialization code)	Actions					
2001/2002, Computer Science, Bachelor studies - 3 years (ST001)	Basic data	Subjects	Clone	Delete	Send Message	
2002/2003, Test - electronics, testing studies - 1 semester (ST001)	Basic data	Subjects	Clone	Delete	Send Message	
2002/2003, Computer Science, Bachelor studies - 3 years (ST002)	Basic data	Subjects	Clone	Delete	Send Message	
2003/2004, Technical education, testing studies - 1 semester (ID3)	Basic data	Subjects	Clone	Delete	Send Message	
2003/2004, Computer Science, Bachelor studies - 3 years (ST003)	Basic data	Subjects	Clone	Delete	Send Message	
Add studies						

Fig. 21. Lists of courses study

Options available on the list of studies:

- Information about study program – by clicking the „specialization code”,
- General information
- Subjects – where opening, editing and removing list of subjects for individual study are possible.
- Clone – for copying one of offered studies with editing possibilities.
- Delete – for removing selected program of studies from database.
- Send a message – that makes sending messages to every student of the study possible.

In case the user selects „Subjects” the list of individual subjects is presented, with following options:

- Show information about subjects – click name of subject
- Edit – Editing information about selected subject of the individual study.
- Delete– Removing subject from the list.
- Add subject – that makes adding new subjects to the list of subjects possible.

In the subject application-form, the subject schedule in semester can be performed.

Subject edition for studies						
Subject name	Electronics (DECS) [v]					
Subject group	Przedmioty zawodowe [pl] [v]					
Faculty	Brak [pl] [v]					
Optional subject	<input type="checkbox"/> (Field selected when subject is an optional)					
Examination after semester:	2 [v]					
Score	6 (Maximum amount of credits, which student can get)					
Semestral schedule of subject						
	sem. 1	sem. 2	sem. 3	sem. 4	sem. 5	sem. 6
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lectures amount/week (h)	<input type="text"/>	3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Laboratory experiments amount/week (h)	<input type="text"/>	3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Ok"/> <input type="button" value="Reset"/> <input type="button" value="Cancel"/>						

Fig. 22. Subject edition panel

Active academic years with deanery groups division						
Specialization code	Course	Study start	Study level	Guardian of academic year	Deanery groups	Options
ID3	Technical education	2003/2004	testing studies - 1 semester		[v]	<input type="button" value="Edit"/> <input type="button" value="Delete"/> Add group
ST001	Test - electronics	2002/2003	testing studies - 1 semester	MSc Paweł Pawełczyk	A [v]	<input type="button" value="Edit"/> <input type="button" value="Delete"/> Add group
ST001	Computer Science	2001/2002	Bachelor studies - 3 years	PhD Eng. Maciej Bargielski	B C A	<input type="button" value="Edit"/> <input type="button" value="Delete"/> Add group
ST002	Computer Science	2002/2003	Bachelor studies - 3 years	MSc Eng. Rafał Doroz	A [v]	<input type="button" value="Edit"/> <input type="button" value="Delete"/> Add group
ST003	Computer Science	2003/2004	Bachelor studies - 3 years	PhD Eng. Maciej Bargielski	B [v]	<input type="button" value="Edit"/> <input type="button" value="Delete"/> Add group

Fig. 23. Groups division

Groups

For creating structure of the study groups; with already created groups.

The list of groups can be modified by the following interfaces: *Add group*, *Edit group*, *Delete the group*, *Send a message* – sending messages to every student of this group

Students

In this unit, the user or the E-learning system administrator can create and explore the score list of students. He is also allowed to add and modify privileges of students to access the e-learning load, to modify personal data of the student and to edit history of study.

After selecting one of the studies lists of groups will appear. User has to select one group in the study and click on the “list of students”. There are of students’ list, which are in selected group and the table.

Options: Edit – editing personal details, *Delete* – removing student’s from the database, *History of study* – editing history of the individual student’s study).

The study History

Student is collecting resources set that define the history of study. After selecting the option, the two groups of checkboxes are offered:

- First – the next semester promotion,
- Second – the ending semester history.

Subjects

Deanery is also allowed to add and edit data about subjects. User can place information and program about courses. He can also link lecture and exercise witch subjects.

Every subject is defined by several services: Proving information about the subject, Basic data record – for inserting general information about the subjects, Lectures – allows editing the list op lectures, within the selected subject, Exercises – is editing a list of experiments, Teachers – creating the list of teachers able to run subjects. Delete – allows killing the subject in database.

History of study information					
Allow to semesters					
Sem.1	Sem.2	Sem.3	Sem.4	Sem.5	Sem.6
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Passed semesters					
Sem.1	Sem.2	Sem.3	Sem.4	Sem.5	Sem.6
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Warnings					
<input type="text" value="info nowe"/>					
<input type="button" value="Update"/>		<input type="button" value="Resetuj"/>			

Fig. 24. History of study edit

Workers

It contains full information about workers, as: personal data, history of scientist work, hobbies, photo and list of subjects they are teaching by individual worker.

Message management

Virtual Deanery can send and receive short messages to students from any group of DL system users. The reporting system allows checking all recorded scores and messages.

Message management						
Number of receive message:		2	Show			
Number of sent messages:		10	Show			
Number of sent messages which aren't deliver yet:		7	Show			

New messages:						
Sent date	Sender/Ac. year/Science/D. gr.	Topic	Receive	Action		
2003-07-07	Igor Kwiecień ST001 Computer Science	A xvxy	<input type="checkbox"/>	Show message		
2003-07-14	Igor Kwiecień ST001 Computer Science	A wiadomość	<input type="checkbox"/>	Show message		
2003-06-25	Igor Kwiecień ST001 Computer Science	A Pytanie	<input checked="" type="checkbox"/>	Show message		

Fig. 25. Message management panel

For sending messages the user has to select option concerning student's group or study than to select option: "send message". After that the window with message containing the application note will be given, where the user has to type a text of message for sending it.

Fig. 26. Send message form

3. CONCLUSIONS

In our registration format several additions can be noticed. They were listed in following way:

A).

- Six characteristic features can be distinguished:
- Flexible interface for new extensions entering,
- Tool-oriented development environment,
- Menu driven web interfaces,
- Sub-databases creation for local users,
- Links for advanced classification system (into MAMS platform),
- Security standards implementation, for personal data and content of the system protection.

B).

Five user-categories have also been defined:

1) **Guest** (not identified)- for the DL content exploration:

- The department presentation,
- Staff home pages (schedule of works and consulting)
- Whole description of available subjects
- Studies schedule and possible rearrangement,

- News and remarks,
- 2) **Student**, with:
 - Interfaces into dean's office (virtual dean's services),
 - Score of current study level,
 - Links for the MAMS database content.
 - Approach into the portal with recommended and available study-subjects, personal score level check-up, remarks, recommended helps,
 - Remote link into visit-register (for consultations or exams).
- 3) **Research** staff, with:
 - Interface for modifiers of personal records within website, besides programming skills (as a hypertext level).
 - Interface for modifiers of a research works list presented in website, besides programming skills as well,
 - Consulting schedule modification,
 - Confirmation interface for the students appointments.
 - Students' scores analysis under MAMS arbiter.
 - Messages transfer interface for student communication.
 - The individual program of the lecture creation using a built-in web pages editor.
 - The MAMS applications rearrangement for lectures mode usage.
 - The schedule of appointments print-out.
- 4) **Dean's office** (Secretariat) option allows to:
 - Create and modify general information (e.g. news, studies remarks, student duties etc.)
 - Change workers' schedules, duties range and consulting flowchart).
 - Modifying the workers' personal data-records.
 - Enter a new student into the group, calling him to follow the study course,
 - Modification interface of study program (subjects entering or canceling).
- 5) **Administrator**, with:
 - Entering the users into the data base
 - Levels of services definition for new users.(rights, available modules).
 - Rearrangement of all options of the system structure,
 - Extension of the system structure and modules.

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Works done for University of Silesia Distance Learning System (DLS) development.

