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DEVELOPMENT OF THE AUTOMATED SYSTEM OF FORMATION OF LOADING DISTRIBUTION ON MASTERS TRAINING SUBJECT

The paper presents the developed models of automated system of loading distribution on Masters training subjects. The system realizes the suggested methodic for formation of distribution of department's loading of subjects of Masters training in scientific direction. The methodic is based on the realization of requirements of Bologna process relating to the formation of loading of blocks of subjects for student's free choice, considering the peculiarity of training process realization by the Institute of Master, Post-Graduate and Doctor Degree Study (InMPGDDS) of Vinnytsia National Technical university concerning the ensuring of the distribution of loading of integral subjects and obligatory subjects for special training of Masters of corresponding directions on the post graduate courses.

Key words: *Computer-based system, load distribution, master degree training, Bologna process, subjects of free choice*

Introduction

Organization of operation of modern institution for higher education requires constant arrangement of great number of documents, which, in turn causes considerable time losses for consideration of information of the same type and fulfillment of routine processes [1]. That is why, let us consider the task of automation of the system of documents turn over in the institution for higher education [2].

The specifics of work of the institute of Master, Post-Graduate and Doctor Degree Study of Vinnytsia National Technical University lies in the necessity of cooperation with profile institutes within the University on the stage of distribution of loading of subjects of Masters training between teachers of the departments, which participate in Masters preparation.

The objective of the work is the automation of the process of formation of distribution of loading for Masters training subjects by formalizing approaches to the creation and application of programming means of automation.

The object under research is the process of formation of distribution of loading for Masters training subjects in institution for higher education. The subject of the research is the means for creation of automated system of formation of documents turnover.

Tasks of research: development of methodic of automated distribution of loading of subjects for Master courses in VNTU; development of automated system for formation Masters training loading distribution (FMTLD), including the construction of normalized data and means for information provision of automated process of loading distribution.

1. Development of models of automated system

Considering the fact, that the departments, teaching subjects to Masters training students and ensuring the necessary information for the formation of loading, are distributed between the Institutes within the University, it is expedient to use the network technologies and internet recourses for simplification of the process of data exchange between the departments and Directorate of Institute of Master, Post-Graduate and Doctor Degree Study. The advantage of such an approach is the insurance of the possibility of remote access to the system and simultaneous work of some users, realization of means for quick processing of information, absence of necessity in specific customers' software. The system stipulates for formation of distribution of departments loading of Masters' training in the kind of unified profiles of documents—"semester plan for loading distribution".

The generalized model of the automated system of FMTLD is presented in Fig 1. The main

components of the system are: core, data base, user interface.

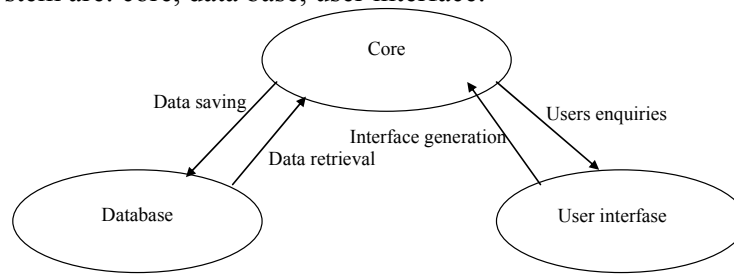


Fig 1. Generalized model of FMTLD automated system

Data base has the normalized structure and stores all the necessary information on departments, teachers, and master students, work plans, selected by students' subjects. The core ensures the processing of users' enquiries and provides for mutually agreed control over the system and network processes, stipulating for using the server programming language PHP4 to build the module of the system. The system is being realized as the autonomous module of the forum of Institute of Master, Post- Graduate and Doctor Degree Study created on the basis of forum "Invision Power Board". The user authorization and access to the formation of the specific documentation is realized via mechanisms of forum user's authorization. Users interface, created with the help of languages HTML and Java Script, has a very simple structure for comfortable using. The automated system ensures functioning of two modes of operation (user's mode and mode of administration) and provides for mutually agreed control over the system processes of their realization.

The core of the FMTLD system ensures the immediate processing of input information stream, realizes the renovation of information resources and formation of data selection from the normalized base.

Using the users authorization parameters of Institute of Master, Post-Graduate and Doctor Degree Study forum, the authorization and access module to the automated system FMTLD realizes the user mode selection or mode of administrator, performing the communicative and distributing function in the process of providing for multi-user mode of system operation.

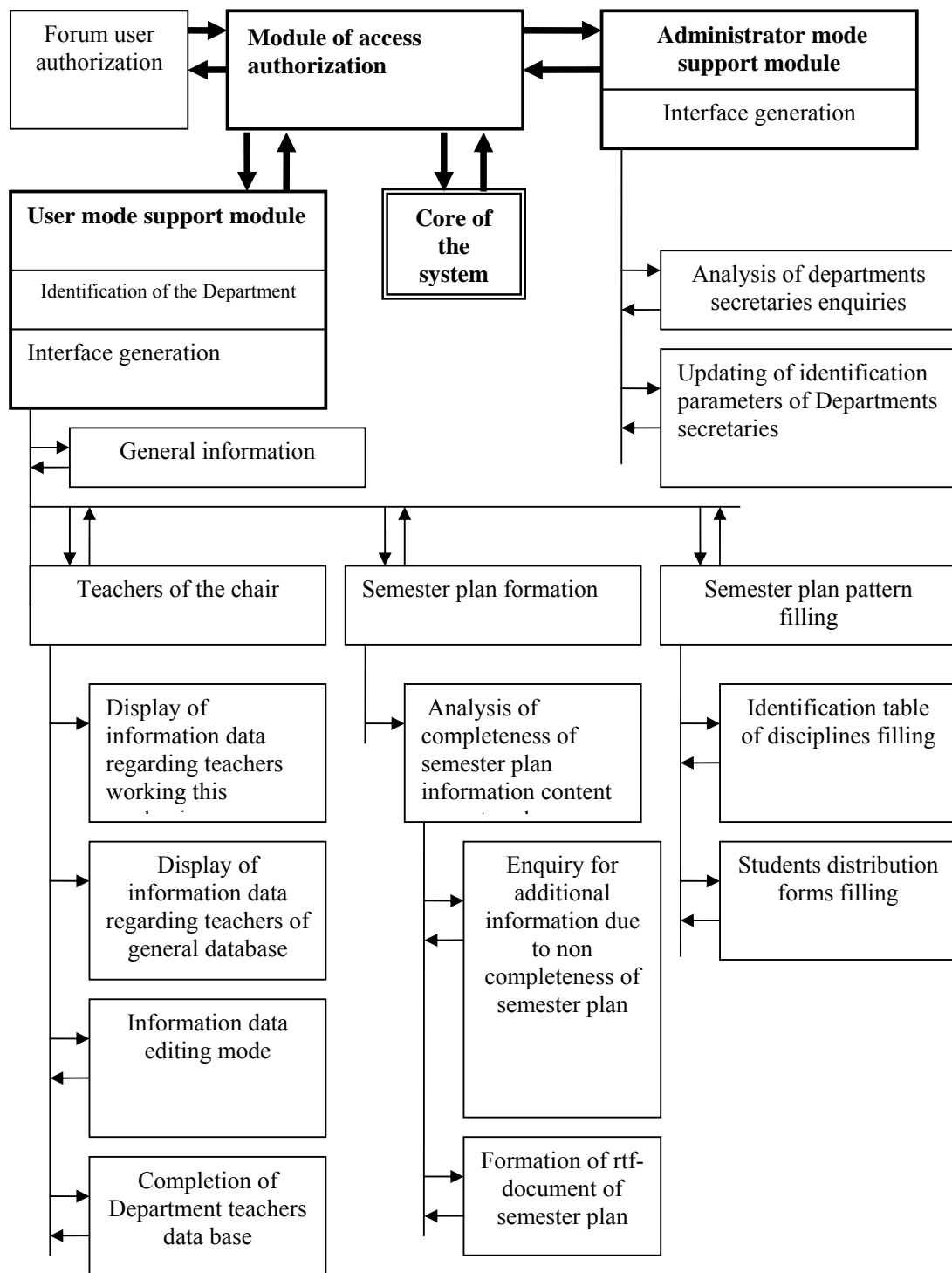


Fig 2. Functioning model of FMTLD system.

2. Development of methodic for automated loading distribution and means for system's realization

Methodic for automated distribution of loading of Master training subjects is based on the realization of the developed models of automated systems following the requirements of Bologna process concerning keeping records of selection of blocks of subjects to be learned in the process of loading formation relating to blocks of subjects to be freely chosen by students.

The peculiarity of organization of training process in the Institute of Master, Post- Graduate and Doctor Degree Study has additional requirements to the process of formation of Master subjects distribution between the departments. One of the peculiarities to the systems software provision is the coordination of the managing and controlling functions in the process of realization of integral subjects loading distribution between the departments, programs of which consist of the complex of the selected blocks following the PhD researches, which are taught by the adjacent department. Apart from that, during the creation of the semester plans for loading distribution, it is necessary to take into consideration the distribution of loading of course subject for special training of Masters in accordance with the corresponding direction of post graduate training

The above requirements stipulate for the realization of these peculiarities by ensuring the system support of reliability of formation of documents with the algorithmic means, determination of parameters of information data, evaluation of characteristics of input information in accordance with the set rules of its selection and data base organization. Algorithmic means of the system ensure the fullness of receiving of output data, which, in turn, allows performing the formation of reporting documentation.

The module of support of users operating mode realizes the methodic for automatic formation of department loading, ensuring the execution of the requirements to the creation of the final system of semester plan for loading distribution.

Users menu (that of the secretary of the department) includes four main points: "General information", "Teachers", "Filling in the semester plan for loading distribution", "Formation of semester plan for loading distribution". The last three points of the menu prior to users authorization are no available and need to be additionally accessed by department identification (fig.3)

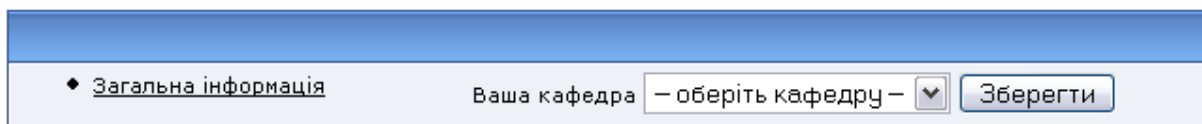


Fig. 3 Interface of authorisation module for the secretary of the department.

Selection of the name of the department is made by the secretary of the department and may be changed by the administrator for only.

If it is necessary to change the name of the department, the secretary has to send the enquiry to the administrator, choosing the name of the necessary department in the menu (fig.4) and filling in the form of comments explaining the reasons for such changes.

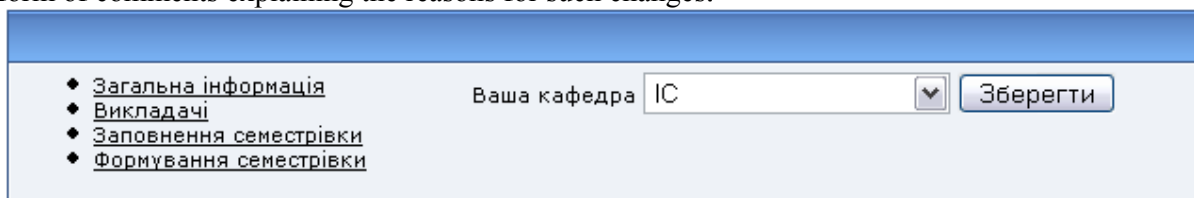


Fig.4. Menu of the secretary of the department.

Menu line “Teachers” provides for the mode of information scanning on teachers, working with the department (first name, second name, scientific degrees, positions), and the mode of editing of teachers data. The set list presents the information of teachers, working with the department during the current academic year. The system however provides the possibility of editing the data on teacher, who previously worked with the department. The renovated table (fig.5) presents these data in the gray background.

<input checked="" type="checkbox"/> Показувати вже непрацюючих на кафедрі викладачів			Додати
ПІБ Викладача	Звання	Посада	
Арсенюк Ігор Ростиславович	к.т.н.	доцент	<input type="checkbox"/>
Ваховська Любов Михайлівна		асистент	<input type="checkbox"/>
Колесницький Олег Костянтинович	к.т.н.	доцент	<input type="checkbox"/>
Колодний Володимир Володимирович	к.т.н.	доцент	<input type="checkbox"/>
Лосев Георгій Олегович		асистент	
Месюра Володимир Іванович	к.т.н.	доцент	<input type="checkbox"/>

Fig. 5. Information on teachers of the chosen department

The secretary is entitled to edit the information of the teachers data base within his department, to fill up the list of teachers and mark these teachers, who do not work with the department in the current year. Renovation and filling up the database of teachers is made by filling in the identification form (fig.6) in which entering the scientific degree and position is realized by choosing the variant from the foaling out list of the menu.

Новий викладач	
Прізвище	<input type="text"/>
Ім'я	<input type="text"/>
По-батькові	<input type="text"/>
Звання	<input type="text" value="к.т.н."/> ▼
Посада	<input type="text" value="викладач"/> ▼
<input type="button" value="Додати"/> <input type="button" value="Відмінити"/>	

Fig.6. Identification form of teacher

Formation of the semester plan for loading distribution starts from choosing the sub name “Filling in the semester plan for loading distribution ” which displays information on availability of list of subjects for current academic year with the determination of Subject name “Teacher/teachers” “Lecture room” (Fig 7).

Семестрівка за <input type="text" value="2007"/> рік		Додати
Дисципліна	Викладач	
Моделювання складних систем	Колодний Володимир Володимирович	<input type="checkbox"/>
	Сілагін Олексій Віталійович	
Методи реалістичної комп'ютерної графіки та прийняття рішень в інтелектуальних системах	Юхимчук Сергій Васильович	<input type="checkbox"/>
	Колесницький Олег Костянтинович	
Математичні методи наукових досліджень	Хазін Марат Борисович	<input type="checkbox"/>
	Ваховська Любов Михайлівна	
Системне адміністрування	Арсенюк Ігор Ростиславович	<input type="checkbox"/>
Методи цифрової обробки зображень та системи штучного інтелекту	Юхимчук Сергій Васильович	<input type="checkbox"/>
	Колесницький Олег Костянтинович	
		Видалити обрані

Fig 7. Patterns of semester plan for loading distribution

Editing of information saturation in the template of the semester plan for loading distribution is made by choosing the necessary subject from data base and determining their characteristics . The operation on adding new subject is made in case of filling in all the fields of identification table by the user (Fig. 8)

Додати запис

Дисципліна: Методи реалістичної комп'ютерної графіки та прийняття рішень в інтелектуальних системах

Триместр	13	14	15
лекція	---	40 год.	---
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		Колесницький Олег Костянтинович	2242 [-] [+]

Інтегральна дисципліна ☐

Fig 8. Form of identification table of the subject

Determination of information factors of block subjects of free choice stipulates for the usage of the form of students distribution between teacher (fig. 9) . The system provides for dialogue mode for formation of students groups for teachers.

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Fig 9. Form of students distribution

The usage of the menu "Formation of the semester plan for loading distribution " foresees the prior filling in of all the fields in data base and formation of rft-document of the semester plan for loading distribution. The availability of empty fields in the form "Filling in the semester plan for loading distribution " sends message with the list of subjects, with unable the process of formation of semester plan for loading distribution.

The important component of the automated FMTLD system is the module of support of the administration mode (fig. 10).

FMTLD system administrator is liable to the control over the identification processes. Graphic interface of the mode simplifies system administration, realizes the administrative decisions, ensures support of identification functions and automated formation of system message for definite

users about the changes of identification characteristics. The administrator has the right to change the information provision for system data base tables.

Conclusions

With an aim of automation of the process of formation and distribution of loading for Masters training subject in scientific directions, there had been developed the models of automated system of documents turnover and the methods for automated loading distribution, considering the specifics of training process organization with Master training courses in Vinnitsa National Technical University. Methodic is adapted to the requirements of Bologna process and realizes the peculiarities of formation of distribution of the department loading with regard to the integral subject and blocks of subjects upon the students choice.

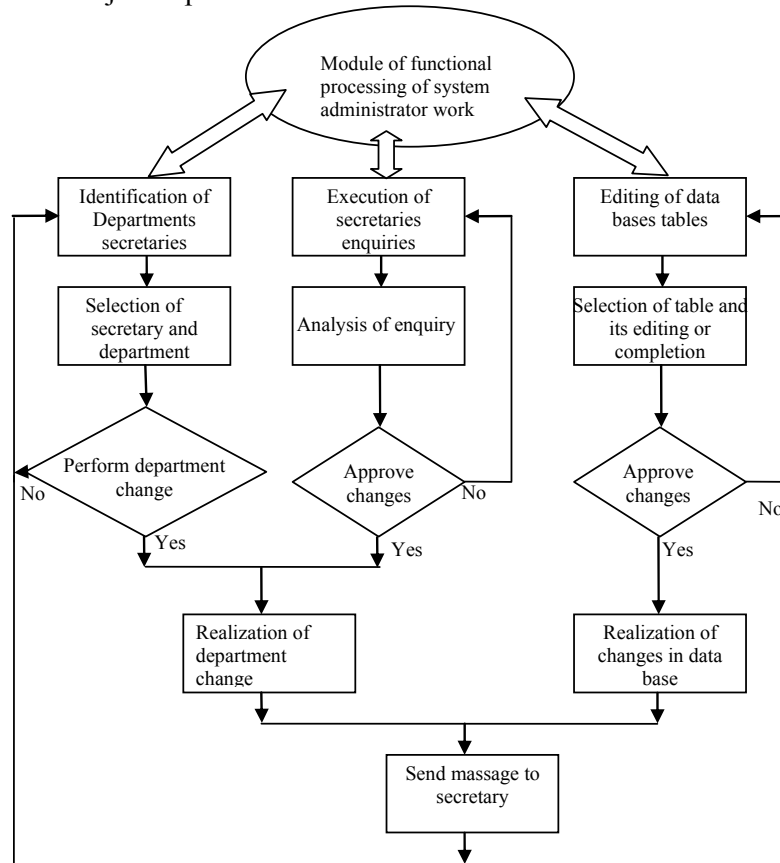


Рис. 10. Модель реалізації функціональних процесів роботи адміністратора

The suggested models of automated system are realized in the separate module of the InMPGDDS forum which ensures the net interaction of the remote users of the system in the process of distribution of department loading and formation of semester plan for loading distribution allow to optimize the process of load distribution by using the developed means for automation and unification of routine processes of processing information of one type.

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