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CONCEPT FOR A UNIFIED ELECTRONIC INFORMATION SYSTEM FOR PROCESSING AND STORING THE EXCHANGE OF INFORMATION RESOURCES AT THE UNIVERSITY LEVEL

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Abstract: As a result of the intensified development of communication and computer technologies, the flow of information concerning higher education institutions has increased many times in recent years. The concept of developing information systems to solve a specific problem no longer works. The report analyzes the current state of the information systems applied at the University of Ruse. Due to the presence of a large number of information systems without significant connections between them, often a lot of time is wasted on making a seemingly simple reference. This burdens both the academic and administrative staff as well as the management staff. A new unified structure of a unified information system is proposed, managing the flows of information coming to the university and sent to external organizations, in order to improve the quality and speed of work. The proposal could be used for other universities and structures.

Keywords: Academic Staff; Information system
JEL Codes: I23, O32

INTRODUCTION

As a result of the intensified development of communication and computer technologies, the flow of information concerning higher education institutions has increased many times in recent years. The concept of developing information systems to solve a specific problem no longer works.

Due to the presence of a large number of information systems without significant connections between them, often a lot of time is wasted on making a seemingly simple reference. This burdens both the academic and administrative staff as well as the management staff.

The purpose of the report is to analyze the current situation of the information systems of the University of Ruse and to propose a new conceptual concept for the development of a modern information system.

EXPOSITION

Existing position

With the rapid development of information technologies and their daily use for collecting and processing different volumes of information, it is necessary to constantly develop and improve various information systems.

While until 10 years ago only a few information systems were used at the University of Ruse, now they are more than 20 separated systems. In addition to all these systems, there are separate servers for access control, e-mail, network resources (shared devices and user accounts) and more.

It is noteworthy that the development of various information systems was done in order to solve a specific problem or to facilitate the collection of a particular set of data, ie. each system is created for itself and without the special possibility to be united with any of the existing systems.

Here is a list of the main information systems of the University of Ruse, which in any case is not exhaustive and complete:

1. Online system "Candidate students";
2. "e-Student" system;
3. Electronic Protocols System;
4. Subsystem "e-Payments";
5. Personnel system, Salary and fees (external program system STYLE);
6. Document management system (external software system "Record keeping");
7. System for student and doctoral scholarships;
8. Health Insurance Contribution Management System;
9. Kiosk and plasma screen management system;
10. Publications system;
11. Doctoral student system;
11. Personnel Development System;
12. e-Learning Shell;
13. Video conferencing platform "BigBlueButton";
    and many others.

There is probably no person at the University of Ruse, who knows the exact number of information systems at the moment!

The significant problem that appears at the moment is that there is no strong connection between the individual systems. Each system operates on its own, with its own database, its own interface and a separate administrator for its management. There is no connectivity of the individual systems or at least their main part.

This results in the collection of the same data several times. As often, they are very different. This creates great difficulties in summarizing certain data and generating various reports, which are required by different structures, such as Ministry of Education and Science, NRA, NSSI, various ministries and others.
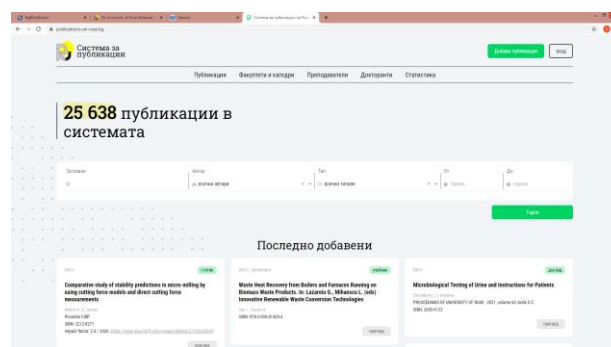
Another problem that is also not to be overlooked is the very different interfaces of the individual information systems. This makes it difficult to work with any system, as you need to know the features of the particular interface.

In FIG. 1 are shown screens of some of the main information systems at the University of Ruse.

Online system "Candidate students"   Publication system
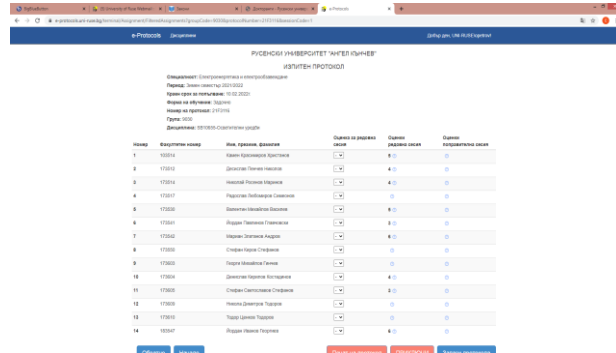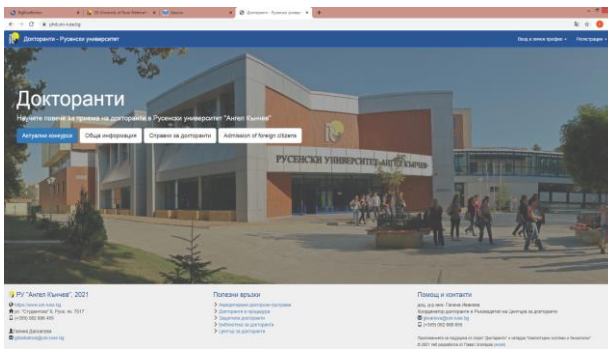
e-Learning Shell   Electronic Protocols System

Doctoral student system   Personnel Development System

Fig. 1. Screens from the work of
Basic information systems at the University of Ruse

Concept for a unified electronic information system

Main important points in the concept of a unified electronic system are:

1. A centralized database with an adequate level of security and data backup.

2. For teachers and employees - access to the system through one place (the most convenient would be a WEB interface, which would be accessible outside the University) - filling in the relevant data in one place. Regular filling in of information (at least once a month), with a sanction provided if this is not done!

3. For students and PhD students - access to the system from one place (WEB interface would be most convenient). Creating fields to highlight important information for them (class schedule, news, etc.)! Ability to check grades, generate reports and the other.

4. For the management - access to the entire database with information presented in a convenient way (summary, graphical and other types of presentations).

5. In case of accreditations and requested references - the data to be extracted from the central database and formed in a certain way for all accreditation procedures.

6. Generation of reports directly from the centralized database. This can be done automatically with specified criteria for the content of the report.

7. On-line connection with the database of the Ministry of Education and Science, and in particular NACID. This is provided for in the NACID development plan - to provide online transmission of information in real time, and not as now to do it twice in year.

8. Possibility to upgrade the database, given the growing volume of processed information.

Quite schematically, the structure of such a system is shown in fig. 2

Fig. 2. Schematic structure of a unified electronic information system

Ready-made information systems for managing information flows at the university level are offered worldwide. In FIG. 3 shows the structure of such an information system developed by MasterSoft.

The problems with ready-made software systems are mainly: the high initial price or commitment to monthly system maintenance fees; the very difficult integration of such a system, given the specifics of the information processes in each university; the difficult local upgrading and operation of such a system.
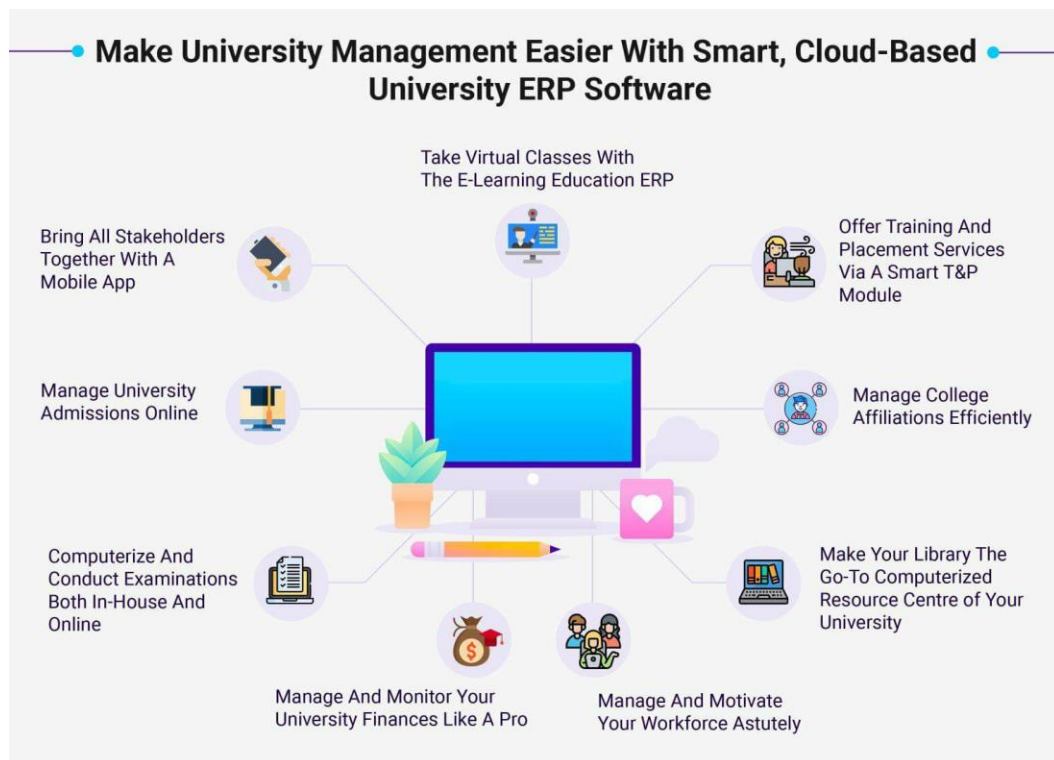

Fig. 3. The structure of a unified information system for
information flow management at a university, developed by MasterSoft

Given the above, obviously the better option would be to develop an entirely new unified information system. For this process to happen, several basic steps must be taken by a sufficiently large and competent team:

1. Very precise analysis and description of the information that will be stored and processed.

2. After consulting the users of the system, the user interface must be built, which will be different for the different user groups.

3. Determining levels of access and ensuring adequate data protection and redundancy.

4. Analyzing and specifying the necessary source information (references, data submitted to external organizations, etc.).

Unfortunately, it should be noted that this process will not be short in time, given the huge amount of information flows used in the various departments of the University.

This report is just an attempt to attract the attention of management staff and to think about the development and implementation of such a system.

In a very joking tone, finally, I can say that if we succeed in creating such a functioning system, we will achieve the UTOPIA of information flows. It will be possible to extract the necessary data in real time without much effort.

CONCLUSION

In connection with the work, the following more significant conclusions can be made:

1. An analysis of the existing information systems at the University of Ruse is made. It was found that their number exceeds 20, and there is no clear and organized connection between the systems. This generally creates two problems: difficulty in generating summary reports covering several information systems; entering the same data several times.

2. A concept of Unified electronic information system for processing and storing the exchange of information resources at the university level has been developed. Its structure and the main points and requirements in its development are presented.

3. Some recommendations and suggestions have been made in the development of such an active information system.

The author of the report does not claim completeness of the considered problem. This is just an attempt to draw attention to the existing problems not only of the University of Ruse, but also of most universities in Bulgaria.

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