

# DEVELOPMENT OF INFORMATION SYSTEMS IN HIGHER EDUCATION INSTITUTIONS

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Present paper focuses on organizational structures functioning of higher education institutions, as well as information systems, optimizing and automating such a functionality. A similar analysis of universities is an example of different countries' institutions. The analysis of competing solutions is adding. There is a detailed study of information support of the State higher education institute "National Mining University", the composition of its internal and external resources raises the question of the development of national standards and standardized approach to the development of an automated university system.

To get a complete and updated information about any event or fact, that is information precedent, processing of information is required not only regarding about this fact, but also about the facts which somehow affected the commission of that precedent. Certainly, handling events that have impacted on the information precedent can be multi-layered, i.e., each event that had an information precedent had their predecessors, and so on.

It takes a lot of preparation and a large number of operations on their treatment to process multi-chain of events, which currently implies on the presence of an information system or its development.

Institution of higher education as a highly organized structure, which operates in several managerial dimensions for ladder diagram and document interactions, requires an information system for its functioning, which is covering all aspects of the university. To develop such system it is necessary to analyze the business processes within the university, under the results of which one can propose the structure of the information system, as well as the need to establish new information system or upgrading an existing one.

Is necessary to fix and identify the structure of the organization and the laws of its activities at the first stage of the analysis, for which one should be familiar with the documents governing the activities of the organization as a whole. Having systematized information we will get a report on:

- the general principles of operation of the organization;
- the OU structure;
- the company profile;
- the rules of interaction with outside organizations;
- key business processes.

In particular, for National Mining University, the main activity is the preparation according to the state order and contractual obligations of highly skilled professionals for the industries of mining, construction, engineering, geology, energy, economy, law, computer science, computer technology, etc. and the organization and conducting basic and applied research.

For it the same activities are: teaching, scientific, innovation and international ones, each of which defines the main goals and tasks. [1]

Considering the structure of higher education institutions (see Figure 1, 2) [2,3,4], one can identify common features in them: the separation of management layers, depending on the lines of activity.

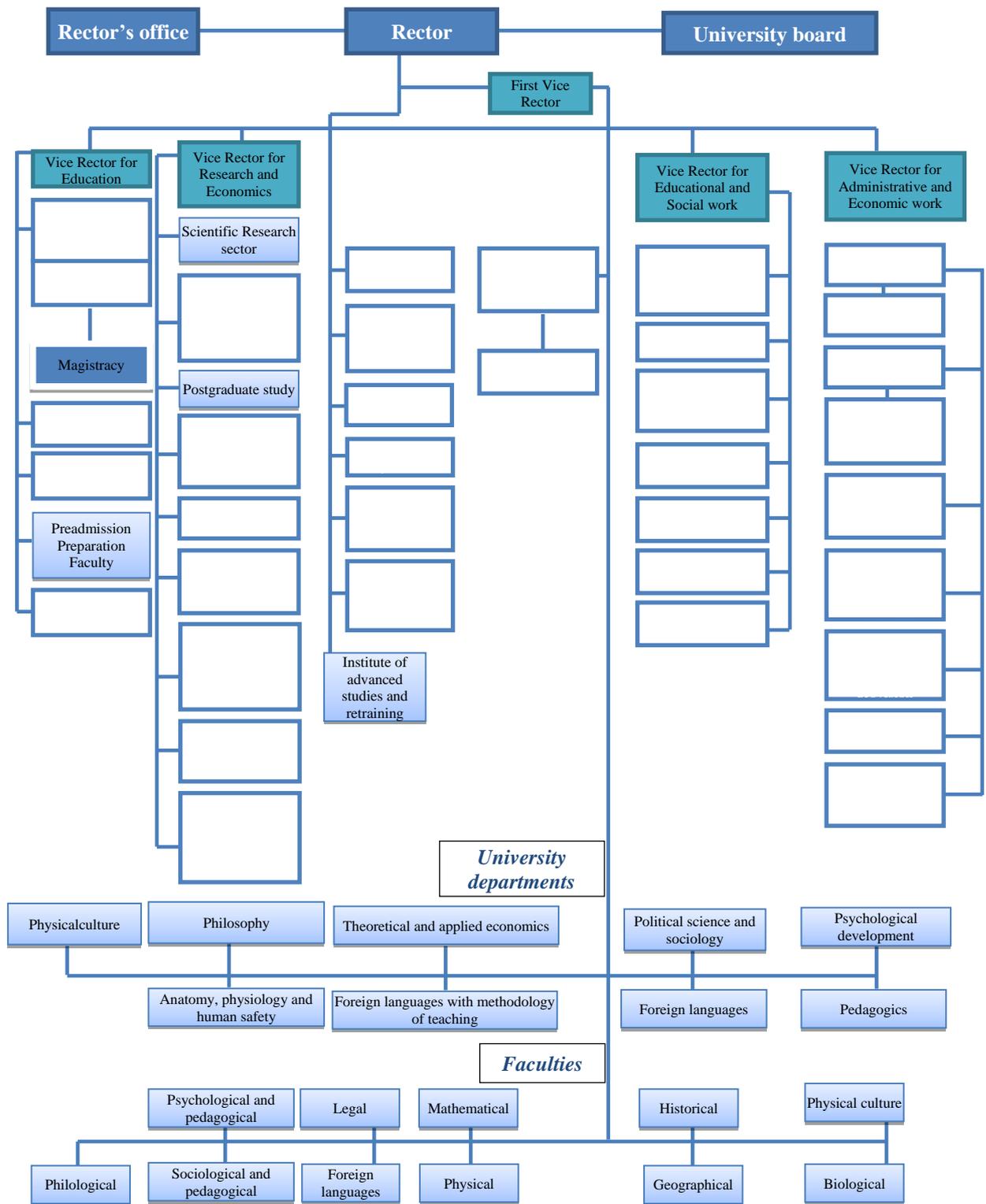


Fig. 1. The structure of the BrestStateUniversity named after AS Pushkin (Russia).

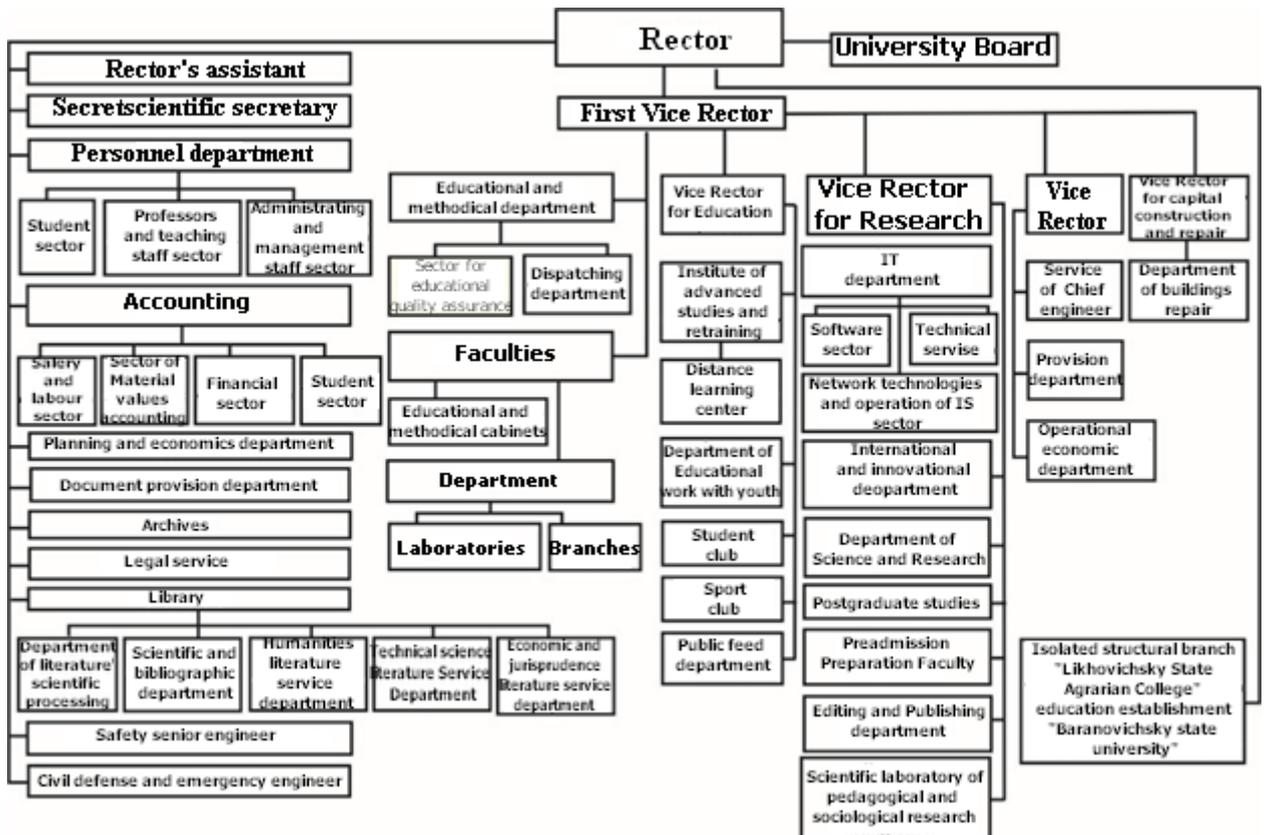


Fig. 2. The structure of the educational establishment "Baranovichi State University" (Belarus).

The further stage of the research is testing of activities of each automated unit. At this time, drafting request forms is need with the help of the staff of the studied units, which should result in a report containing the following sections:

- the structure of the organization;
- the total list of business processes of the organization;
- descriptions of the units;
- name of the department;
- documents regulating the activity;
- functions;
- incoming documents;
- outgoing documents;
- revision of the existing organizational documents;
- the results of the division.

Types of business process is convenient to group by type:

- Key business processes - generate a revenue.
- Supporting business processes - support infrastructure.
- Business process management - manage.
- Business development - develop.

In the analysis of business processes of the department (Fig. 3, 4) [5], the division of department's business processes is shown as well as its organizational structure.

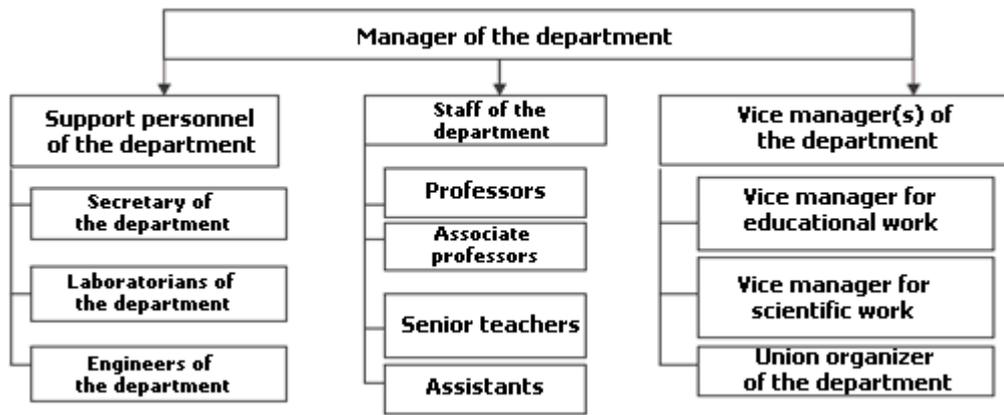


Fig. 3. The organizational structure of department

Further action on the analysis of business processes is a refinement of the received information and a detailed study of business processes.

After a detailed explanation of the existing business processes in higher education, it is advisable to take advantage of approaches to the management and organization of IT services aimed at meeting the needs of business, such as ITSM and ITIL.

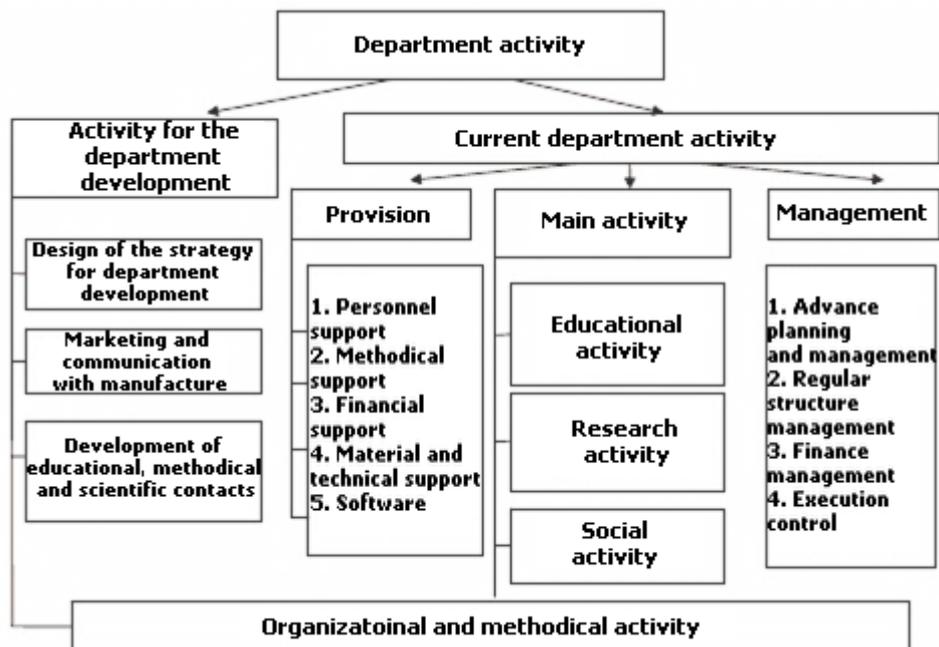


Fig. 4. Activities of department

In contrast to the more traditional technological approach, the ITSM recommends to be concentrated on a client and his needs, on services that provide the information technologies to an user, but not on technologies. Thus process organization of the grant of services and presence of parameters of efficiency (KPI), advance stipulated in agreements about the level of services, allow IT-departments to give high-quality services, to measure and to improve their quality.

An important moment at the exposition of principles of the ITSM is the system. On a mandatory basis at the exposition of each composite element of the ITSM (management of the incidents, management of the configurations, management of the security, etc.) traced

intercommunication and coordination with other elements (services, processes) and at the same time there are given necessary practical recommendations.

The ITIL isn't a concrete algorithm or guidance to the action, but it describes the front-rank experience and offers recommendations of the organization of the process approach and management of quality of the grant of the services. It allows to unstuck from the features of this concrete enterprise in this concrete industry. At the same time, in spite of the certain abstractness, the ITIL is every way aimed at the practical use.

In every section of library there are key factors of the success of the introduction of one or another process, practical recommendations, at the same time, prevail over the cleanly theoretical reasonings.

On the basis of these approaches at MoscowStateUniversity implemented the project University, which is based on the already prepared software products, i.e. consists in configuring and finalizing of the product under the necessities of a customer. Within the confines of the project, executed at Faculty of Computational Mathematics and Cybernetics in MoscowStateUniversity, is used the package of CA USM.

The experience of the introduction and the exploitation of the informative system «University» rotined, that further effective development of IT at a faculty would appear impossible without the modification of management processes. In 2005-2006 were developed «The conception of the development of the system of information-computational services» and three-year plan of its realization.

As primary purposes development of IT in accordance with the business-necessities of faculty and providing of economic efficiency IT are defined. One of primary tasks described in conception is reorganization of processes of IT management in accordance with modern standards. Reorganization of management processes is a sickly thing, so it was decided to inculcate practices of ITIL gradually, starting with a financial management IT [6]

Well-known in Russian Federation, developed by the corporation «Galaxy» system of automation “Galaxy Management of Institute of higher”, which is capable of

- carrying out the effective plannig of the educational process
- uniting basic subdivisions in the single informative system of institute of higher.
- reducing labor intensiveness of computational processes.
- promoting authenticity and operationability of treatment of information.
- putting in order business-processes.
- reducing probability of customer's errors.
- providing control and management by financial and skilled resources.
- providing the operative forming of the administrative accounting for guidance of institute of higher [7].

Nevertheless, in the conditions of the Ukrainian legislation, system “Galaxy Management of higher educational institutes” has not had application yet, because of great number changes which are necessary for its introduction.

In the University «Ukraine», as a system of automation of Institute of higher the product Microsoft CRM Dynamix is inculcated. It is an application software for organizations, intended for automation of strategies of co-operating with customers (clients), in particular, for increasing of level of sales, optimization of marketing and improvement of service of customers by the maintainance of information about clients and history of mutual relations with them, establishment and improvement of business-procedures and subsequent analyses of results.

CRM is a model of co-operation, supposing, that the center of all business philosophy is a client, and that the basic directions of activity are measures on support of the effective marketing, sales and service of customers. Support of these business goals includes collection, storage and analysis of information about users, suppliers, partners, and also about the internal processes of company. Functions for supporting these business goals include sales, marketing, customer support.

Having analyzed the existent systems in State Institute of higher the «National mining university» the composition of external resources of university, accessible from a world network was defined (fig. 5):

- Server-portal of NMU.
- Server-portal of intersectorial institute of continuous education.
- Server-portal of institute of extra-mural education.
- System of the controlled from distance education.
- On-line module «the electronic library».
- Server-portal of receiving commission.
- Module-client of a single state electronic base on educational questions.

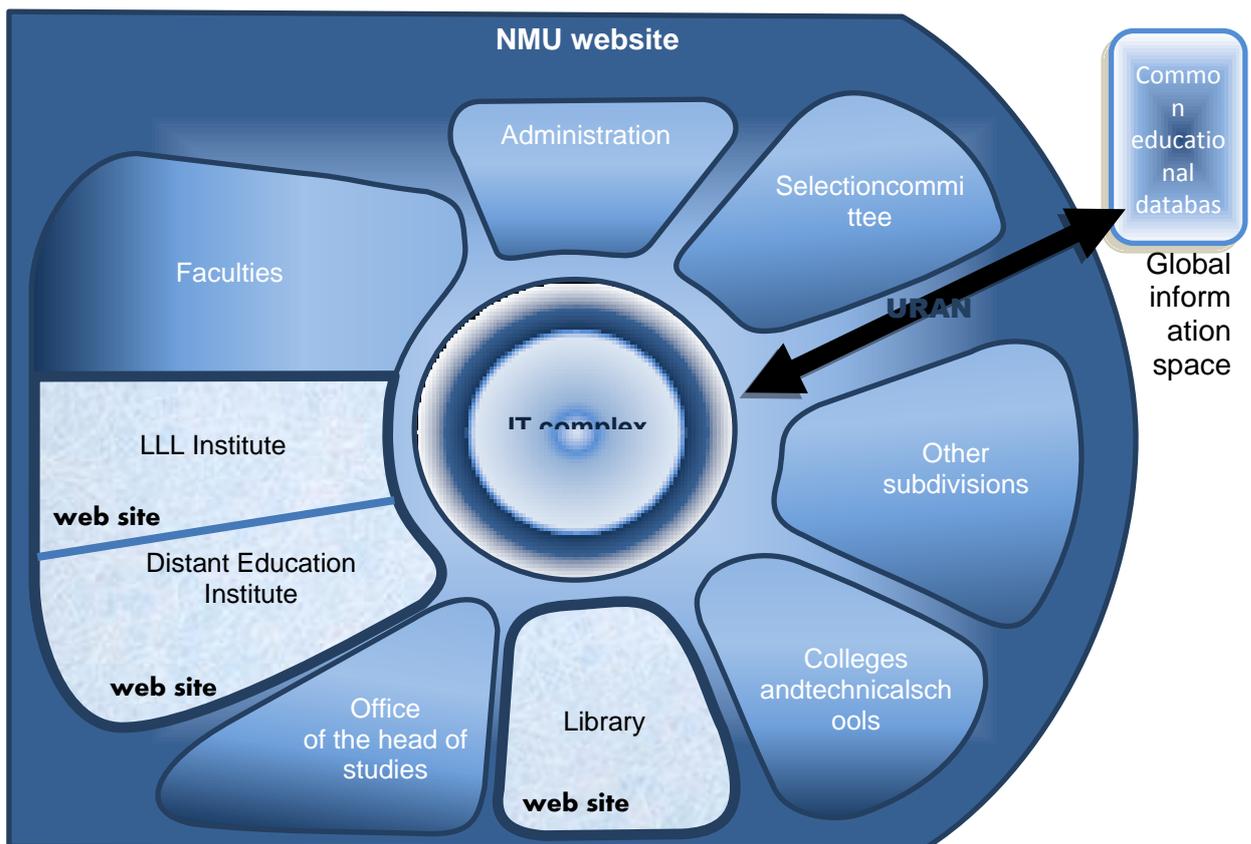


Fig. 5. External resources of state institute of higher the «National mining university».

Programmatic decisions used inside (in local networks) the university, (fig. 6) consist of:

- Automated system “Dean's Office”.
- System of electronic account of the receiving commission.

- The electronic system of circulation of documents «Corporate portal of NMU».
- Electronic library.
- «1C: Book-keeping » in configuration for the Institute of higher.

The most widely in-use system of all is the system “Dean's office”, created on principles of single informative space and being based on the single logical model of data.

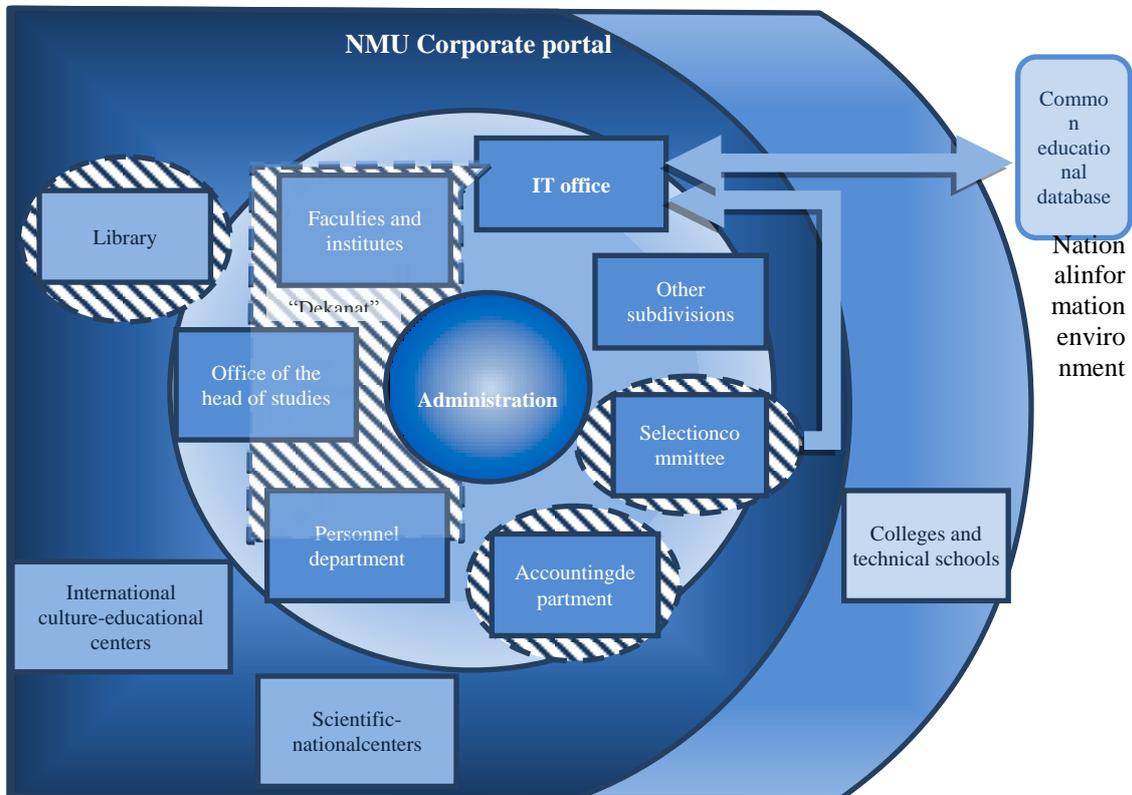


Fig. 6. Internal resources of the state institute of higher the "National mining university". (The shaded areas represent informative coverage / presence of the specialized software, used by one or another subdivision of the university).

The study that had undertaken showed that existing system of the informatization of the State Institution of Higher Learning "National mining university" covered near 60% of all business process of the State Institution of Higher Learning and also is considerably fragmented. It seems that similar unencouraging conclusions are possible to do in a relation to most of the higher learning institutions. As authors suppose it is not deprived sense to revise the existent system on the basis of the accumulated experience and the experience of the Institution of Higher Learning of Ukraine to produce recommendations and even general conception for presentation at the national level and for introduction in interested Institution of Higher Learning

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