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Development of Regional Education Systems Based on Innovative Technologies

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Abstract

The paper studies the development of regional systems of education based on innovative technologies. The basis of the modern education system is the high-quality information educational environment, in which the use of new information technologies should contribute to the solution of pedagogical problems. Contemporary studies focus on the development of methodology for the use of electronic educational resources in the education process, the technological environment for the educational services is analyzed. The IT strategy of the Information and Computing Center of Dagestan State University (DSU) is considered. The main objective is to identify the correspondence between the working activities of the ICC and the strategic plans of the DSU.

Modern innovative educational technologies

Nowadays the development of regional education is impossible without the use of modern innovative technologies. The development of both traditional theories of teaching (activity-based teaching, student-centered teaching, caseteaching, programmed teaching, algorithmization of teaching) and distance teaching, "e-teaching", project-basedteaching occurs under theinformatization of education (under the implementation of teaching ICTs).

The basis of the modern education system is the high-quality information educational environment, in which the use of new information technologies can help to solve pedagogical problems.

The open education systems need to create an environment capable to integrate the resources of various automated educational systems (AES). This is known as the information educational system of the open education. The education systems of departments, faculties, schools, trainingareas (specialties) may become the AES in higher education.

Information resources of education institutions portals include not only educational and training materials but also information about the structure and functions of educational institutions, information on the conditions of the provision of educational services, database of teaching staff and researchers, the electronic publication of books, academic articles, theses, information on the scientific and methodological conferences and seminars, and others.

The use of modern educational technologies for teaching requires electronic educational resources (EER) for each discipline. The structure of the EER includes: instruction for students and teachers; teaching materials (theoretical course, practical course, laboratory practice, teaching materials, self-control materials, tests, exam cards, additional materials, links to specialized magazines). E-teaching materials should meet both traditional and specific requirements:

- completeness of the presentation in accordance with the direction of the standard;
- availability of presentation;
- scientific content;
- the logic and consistency of presentation.

Contemporary investigations focus on the development of methodology of electronic educational resources using in the learning process [1-3]. The technological environment for providing the educational services is analyzed.

The study of artificial intelligence systems and the development of artificial intelligence methods are carried out: knowledge presentation techniques, modeling techniques, training methods. Semantic models were developed for the natural science disciplines, providing a rational phasing of the development of educational models, the implementation of specific academic disciplines curriculum requirements.

The modern teaching theory regards the study of scientific disciplines as the teaching of pedagogically adapted fundamentals of scientific knowledge.

In traditional teaching at different stages of the learning process students are provided with actual material as much as possible. In order to solve creative problems, to which the learning process refers, it is necessary to offer knowledge representation system based on logical-semantic approach which allows you to display tasks in a structured model that takes into account links and relations between elements.

Presentation of the logical structure of educational material in the form of semantic model and simultaneous presentation of the basic concepts of the subject and the relationships between them allows you to visualize the subject area being studied and facilitates its perception by students.

Experience shows that the development of semantic models, the process of building a model promotes efficient knowledge acquisition. This approach to knowledge organization can reduce the amount of memory occupied by the database and knowledge, significantly reduce the time of training.

IT strategy of Information and Computing Center DSU

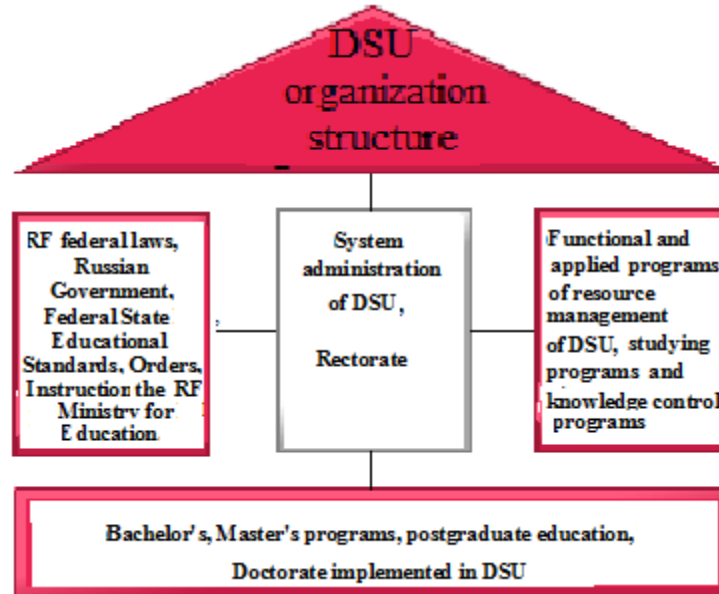
The information society places new demands and standards for the education system. The highest value of the society is that the information should be available to every student in all its forms, amount and methods of representing. Higher education institutions tend to meet these requirements, should implement IT in the educational process, management system, develop its information system and strive for rational use of IT resources. The greatest effect of the information structure (IS) of the organization can be achieved in the presence of strategic planning of IT systems. University IT strategy should ensure the orderly development of its information system, dynamically changing it according to the requirements of society and the institution of higher education. The competitiveness of the university depends on this effective management and implementation of modern standards in the field of IT management.

Effective strategic planning involves clearly defined objectives, a limited number of ways to achieve the vision and understanding of what kind of organization resources are required for its implementation. IT strategy of the university is the part of its corporate strategy, one of the functional strategies. IT strategy, or a strategic plan for the development of information technology is a scenario in which it is supposed to develop the information-processing system of the university.

Most Russian companies do not have any IT strategies. At best, there are indicative plans for the year ahead, which are not always fulfilled. According to the estimated summary of consultants the IT strategy has already been implemented at 30% of enterprises and 50% want to have it. Universities are not exceptions as well.

IT strategy is a concept paper, which should contain no needless technical details. All the technical details of the projects implementation may be contained in the annexes to the IT strategy or other documents. IT service is a complete business division of the University participating both in daily operations and in achieving strategic business goals.

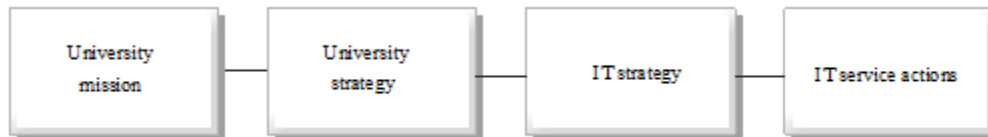
The subject of study of this article is IT strategy of Information and Computing Center DSU [4-8]. The main objective is to identify the correspondence between the activities of the ICC and the strategic plans of the DSU. For a more visual representation presented models designed with an easy to use ARIS Express modeling tools.



Model1. House ARIS DSU.

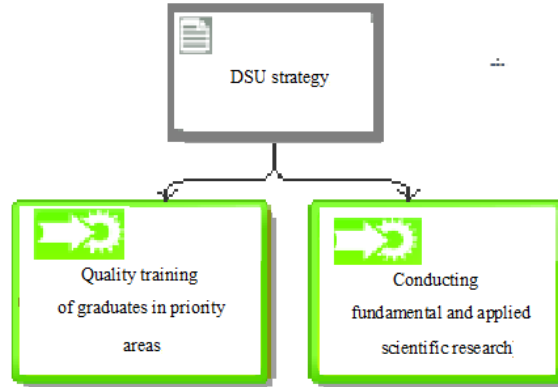
ARIS House DSU is a formal image of his mission, indicating the position of the institution in the system of higher education of the Russian Federation. Filling the individual functional blocks in and using ARIS Lodge Gap-analysis, you can get a detailed strategic plan for the high school transition from the present to its future state.

The mission of the organization defines its strategy, which, in turn, forms the IT strategy. IT strategy, in turn, dictates the actions of IT services.



Dagestan State University gives preference to innovative approach and efficient implementation of innovations in all areas of university activity. Dagestan State University's mission is to provide high competitiveness on the domestic and foreign markets of educational services due to high quality comprehensive training, as well as their personal, scientific, educational and practical level corresponding to world standards of classical university education. It is the mission which determines the direction in which you need to develop the university, which direction you need to take as a priority.

Considering the importance of all aspects of the educational process, a key determinant of the quality of education in the DSU is the level of research in priority areas of science, technology and engineering of the Russian Federation.

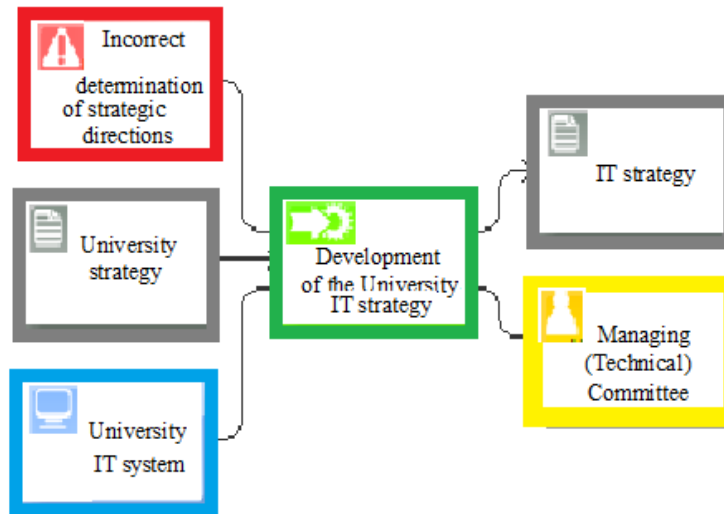


Model 2.Strategic activity of the university

ICC as an IT service of DSU should facilitate the university in achieving its strategic objectives. ICC DSU determines the main directions of the working activity just in the line with the DSU strategy. Conferences, surveys, presentations of up-to-date software and information technologies with the participation of developers and inviting concerned persons are regularly held, ICC is a participant of the annual national exhibitions of information technologies and computer engineering.

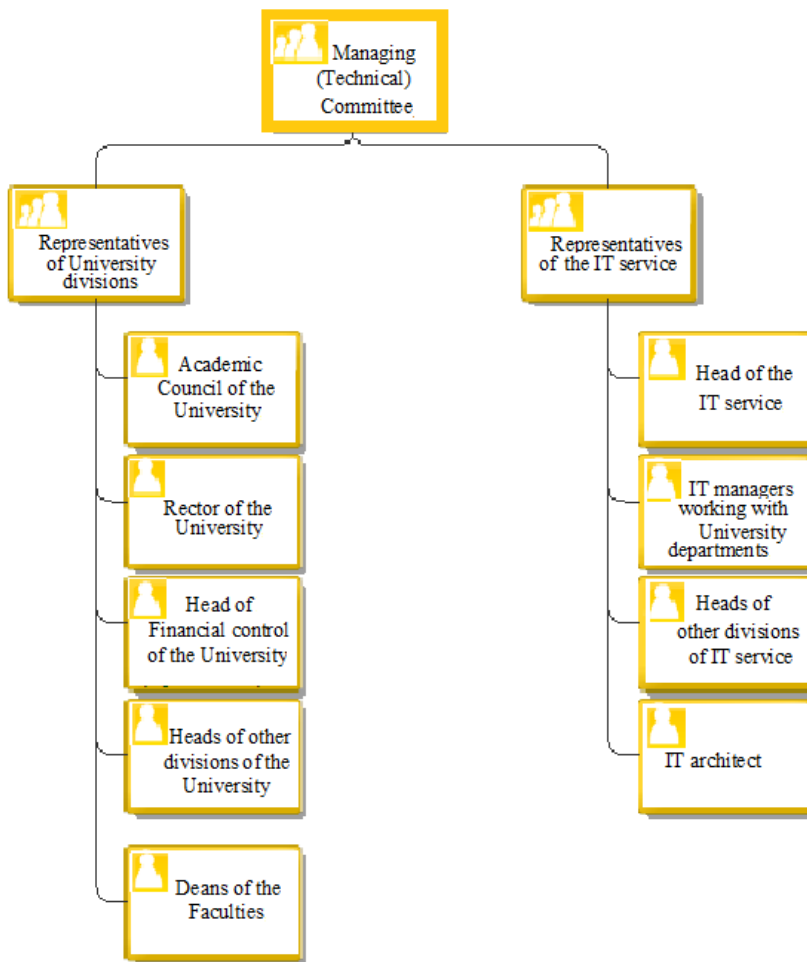
Important objectives of the ICC DSU is to ensure the maximum use of information technology in the learning process in order to increase its efficiency, accessibility and quality, creation and development of modern distance education system and the modernization of the computer facilities of the University.

The process of developing the IT strategy is not possible without the creation of a detailed document "Strategy of High school", even if it exists, there are risks related to the incorrect definition of the strategic areas of the university. IT strategies are limited by the inherited IT architecture. Both representatives of the top leadership of the university and representatives of ICC service take part In creating the IT strategy.



Model 3.Chart of the University IT strategy

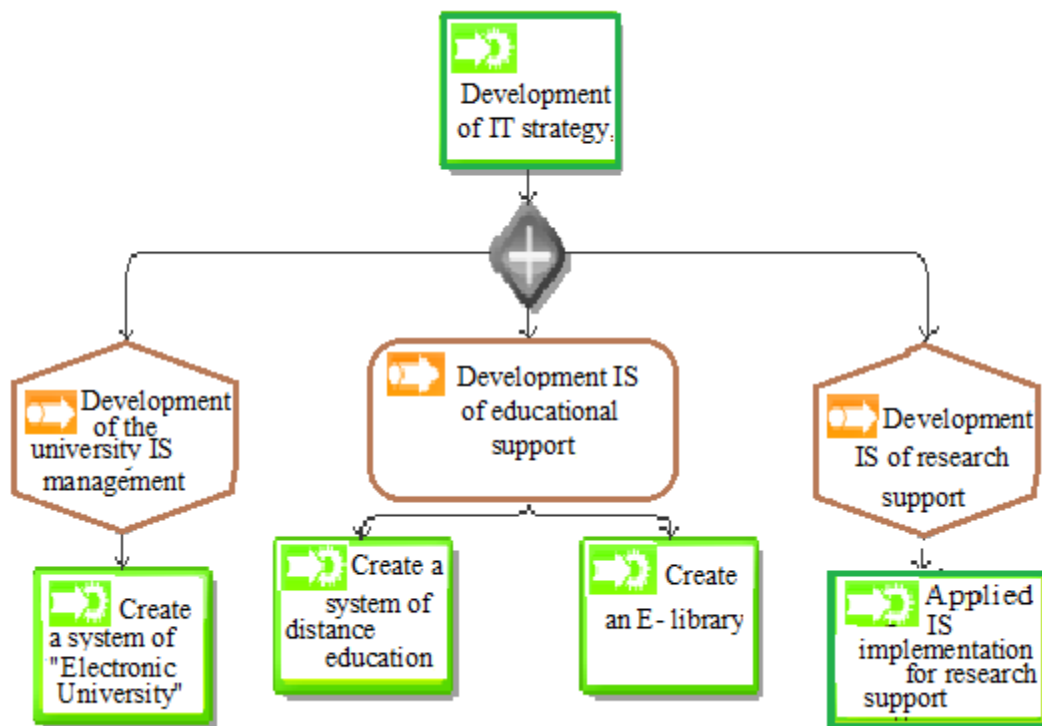
Managing (Technical) Committee is the administrative structure associated with the adoption of a strategy in the field of IT solutions and at the same time the method of its financial implementation.



Model 4. Organizational Structure of the University Managing (technical) committee.

The strategic activities of IT services as a structural unit of the University, designed to solve the issues of implementation of IT in education, science, culture and management, together with innovative university structures identified:

1. Computerization of management at the University;
2. The introduction of new information technologies in the educational and scientific process;
3. The introduction of new information technologies in the research activities of the university.



Model 5. The main strategic directions of development of the university information system

Conclusion

Introduction of innovative technologies in the educational process leads to the efficiency of the pedagogical process, improving the quality of training, reducing the time of presentation of educational material. Using modern methods by teachers in higher education process contributes to the development of creative abilities of students, to overcome stereotypes in the teaching process.

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