On Analytic-Information System of Scientific Problems Register

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Abstract— **The paper reviews issues related to development of analytic-information system of scientific problems register in order to support scientific activity management issues. It has been demonstrated that system data base is formed based on information collected from scientific institutions of the Republic of Azerbaijan. Analytical examinations considered in the system will support organization and management of science and making justified decisions.**

Keywords— *e-science; scientific directions; scientific problems; scientific problems register; analytical-information system*

I. MOTIVATION

In modern environment, transfer to information society has set important objectives and functions for scientific activities, as well as other fields. Solution of important tasks such as creation and development of research activity in accordance with modern requirements, improvement of scientific management, formation of national electronic scientific information space and integration to world scientific space integration is important. Electronic science (e-science) project conducted within the framework of scientific reforms conducted in the country covers these issues. Creation of scientific information resources with different appointments and objectives, and making of operative decisions based on knowledge in the science management process using intellectual analysis technologies are primary directions of e-science [1-3].

Creation of scientific problems register (SPR) provided in the paper is one of these works. Here, main objective is assortment of scientific problems, i.e. collection, and systematization of information on scientific directions of separate scientific institutions of the republic and problems surrounding them, and support of science management based on analysis of that information.

II. PROBLEM STATEMENT

Solution of issues related to creation of analytical-information system of SPR in order support research activity management issues are reviewed in the paper.

III. SOLUTION OF THE PROBLEM

Institutions engaged in research activity in the Republic of Azerbaijan (RA) are institutes of Azerbaijan National Academy of Sciences (ANAS), scientific-research institutes of higher education institutions, field scientific-research institutions under subordination of Ministries and other institutions. Competent institution engaged in organization, management and coordination of their activity is Committee of Organization and Cooperation of Research Activity of the Republic (COCRAR). Problems Committee (PC) conducts activities such as determination of fundamental and applied scientific researches of primary directions and subjects on scientific directions, provision of research conduction on these directions by scientific-research and higher education institutions of the republic, preparations of plans of scientific-research works by scientific-research and higher education institutions, supervision of consideration of primary problems and subjects in scientific-research work plans, coordination of scientific researches in scientific-research and higher education institutions, elimination of repetitiveness in scientific researches, provision of organization and supervision of complex scientific-researches related to fundamental and perspective problems.

Reestablishment of those committees through application of modern IT, supports effective management in science. For this purpose, SPR system projected as information collections based on information collected from scientific institutions, objectively characterizes activity indicators of any subjects of the republic engaged in scientific-research. System is considered as a constant information resource intended for later use of data collected in data base (DB) and created in order to improve the structure of scientific complex of the country, increase the effectiveness of scientific research works, support decision making related to organization and management of science.

SPR system consists of blocks covering following constructive issues (figure 1):

− About Register (about system, register structure, organizational structure of scientific activity in RA, structure of organization of scientific-research activity related to directions of science, main directions of scientific-research works in RA);

− PC on scientific directions (PC's, structure, institutes, scientific directions and problems by years etc),

− Normative-legal documents (decrees, resolutions, orders etc);

− COCRAR (information about regulations, structure, bureau etc);

− Scientific-research works conducted in the Republic (scientific directions and problems of organizations by institutions, yearly and perspective plans, annual reports);
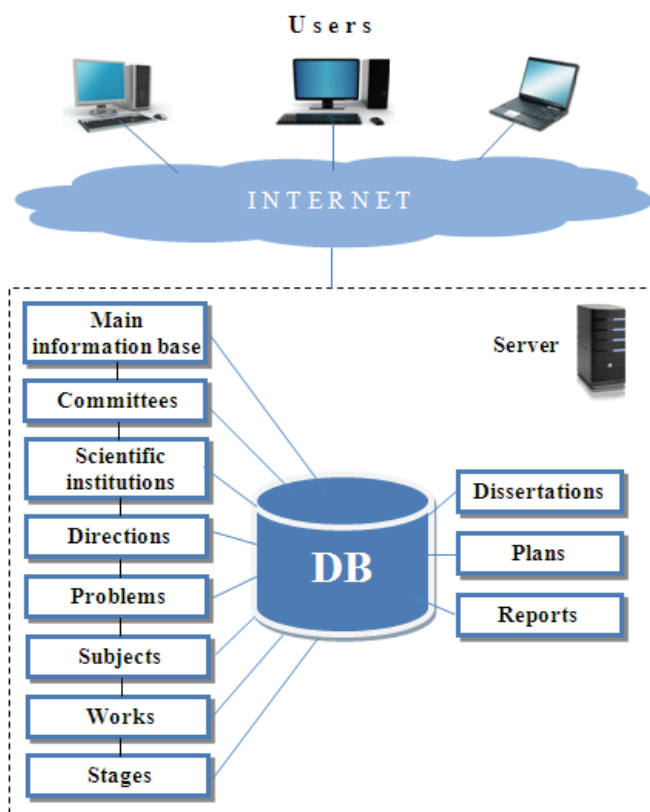

- Figure 1. Information model of scientific problems register

− Dissertations bank (documents necessary for registration of dissertation subject in PC; dissertation subjects registered and defended by institutes and over years etc);

− Analytical and scientometric analysis (analytical analysis, reports, statistics);

− Statistical reports (number of scientific directions, problems, subjects by institutes, and number of included PC's, number of dissertation subjects (registered and defended) etc).

Information about organization's research activity directions, problems, subjects, works and stages, annual and perspective plans, financial resources of research works, annual reports and obtained results, planned and defended dissertation etc are located in corresponding sub-bases of SPR.

Mutual relations scheme of data in DB is provided in Figure 2.

As it's known, similar to other fields, management includes all activity fields of science and its essence is to completely reach the set goals by effectively using resources possessed by scientific institutions [4].

Analysis considered in SPR system support solution of science management issues. Let's review capabilities provided by this approach.

As is known, planning is an overall function of management, and determines current and perspectivecondition of scientific activity. Information about annual and perspective plans of relevant institutions are located in "scientific institution sub-base of EPR. Based on this information, formation of surveys about plans of scientific institutions of the republic and obtainment of relevant results are considered.
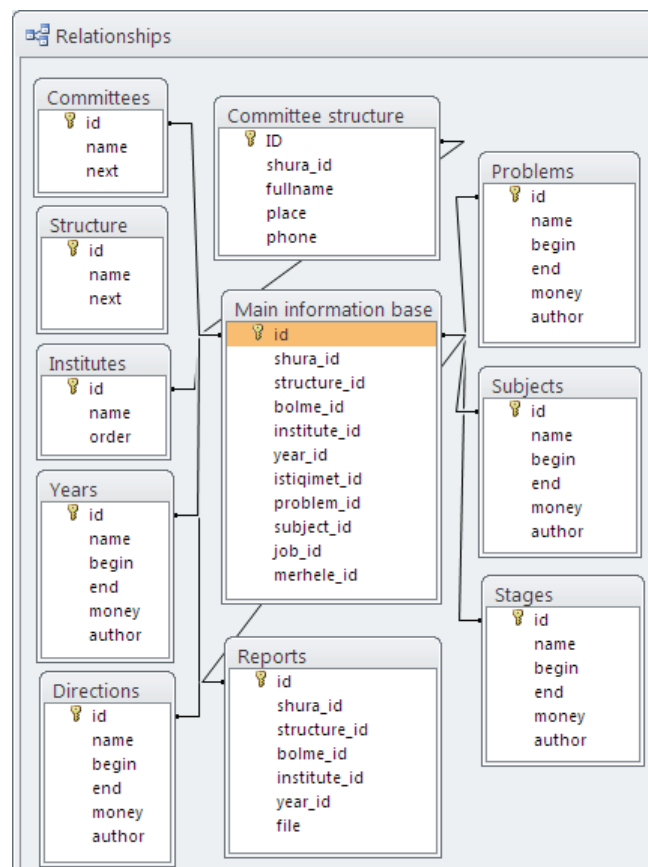

Figure 2. Mutual relations scheme of data

Following main function of management is organization. Its objective is to provide implementation of accepted plan tasks in considered time period and capacity. As we know, ANAS Scientific Organization Department supervises implementation of these functions in the Republic. This supervision process is carried out automatically in the system.

Effective communications and information exchange play an important role in management. Operative vertical and horizontal information exchange within the framework of informationcollected in the system are provided.

It is known that, coordination, which is another function of management, is directly related to planning. This way, coordination function is intended to coordinate separate operations, their stages, activities of researchers and

collectives. As information related to activity of scientific institutions of the republic are integrated in projected system, associated activity and mutual effect of their separate components, coordination of dynamic and balanced development as a complete system are provided.

Main objective of supervision function is to provide coordination among decision making and its implementation, eliminate deficienciesand separate suspension cases. Registration, evaluation and analysis functions of supervision are carried out automatically in the system. Here, the main issue is to expose suspension cases and evaluate them, develop management decisions for editing-regulation purposes. It is known that, labor motivation plays the main role in management and increasing the quality of staff activities. Exit data of the system can be used in solution of this issue.

Let's note that, analysis and evaluations considered in the system support management decisions' formation and making for solution of issues such as assortment of scientific problems, as well as above-listed issues, coordination of scientificresearches, exposure of repetitiveness in scientific researchers etc.

System software is implementedon Windows platform, Apache web server, MySql relational data base management system and PHP programming language.

IV. RESULT

Modern ICT technologies are widely applied in solution of science organization and management issues. SPR analytics-information system designed in ANAS Institute of Information Technology will create additional opportunities in science management.

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