Geochemia: Information Systems to Support Chemical Analysis in Geological Research

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In Bulgaria, mineral resources are property of the State. The State's Committee of Geology (SCG) executes control and supervision and supports on geological researches. The last includes access to information and laboratory services.

SCG has established a system, whit the following functions:

- Distribution of soil samples among the laboratories;
- Execution of quality control on the chemical analytical methods used in laboratories;
- Maintenance of the information fund (archive).

The enterprise, responsible to the performance of the system is "Geochemia".

The case specifies the functions of "Geochemia", information systems and technologies used to support execution of its activities in the time of transition to market economy.

It provides basis for development of course projects in three areas:

- Design of database and TPS;
- Design of a MIS for quality control;
- Development of DSS: Statistical Inference Procedures for usability and calibration of chemical analytical methods.

BACKGROUND

Until 90's, the Government had complete monopoly on all activities, related to research and exploration of mineral resources in Bulgaria. In 1973 the State Committee of Geology (SCG) was established to represent the Government in these areas. Its objectives includes:

- conducting geological researches
- establishing of a network of enterprises to support researchers, and
- assisting the other entities in making decisions regarding exploration of mineral resources.

Among all other responsibilities of SCG is the correctness of inferences and decisions, made according to the results of geological researches. Therefore, the quality of the analysis

is a highly important issue.

In late 70's SCG had established a network of enterprises to support research activities. Among them, was established the system of chemical laboratories, specialized in performing chemical analysis on soil samples excavated in geological researches. Organizationally, the laboratories were subsidiaries of SCG. In 1982, all chemical laboratories were united under a specialized entity – "Geochemia", which was responsible for the soil samples processing. The process aims avoiding possible bias, mistakes, and inaccuracy of he analyses. "Geochemia" was authorized to represent SCG in the following activities, which defined also its major functions:

1. Distribution of soil samples among the laboratories and control on the results;
2. Control on adoption of new chemical methods and quality control on performance of chemical methods in laboratories;
3. Maintenance of sample archive and information fund and providing access to them.

Since 1990, Bulgaria has started a process of transition from completely centralized to market oriented economy. In 1997, the system of SCG was reorganized to cease the State's monopoly on geological researches, preserving for SCG only the functions of monitoring the research. SCG issues license for conducting research and the researchers are obliged to provide to SCG detailed information about findings. The new role of SCG is the role of an information agency. It advises both the Government on the issues related to giving concessions of exploring mineral resources, and the geological teams about known findings in the areas of research and about the support they can rely on in the country. In its new role, the position of SCG was lowered to a department in the Ministry of Environment.

The enterprises established to provide support to the research teams have been turn into independent entities. "Geochemia", and also each one of the specialized laboratories were separated as independent, State's own entity and were placed on the free market of laboratory services.

Reorganization of the SCG system requires reevaluation of "Geochemia's" objectives; its interaction with laboratories, from one side and with research teams from the other. Also, relations with SCG, as the representative of the State, have to be reconsidered and transform on a contractual basis. In the monopolistic era prevalence were given on reliable and accurate results and the other aspects of the service were underestimated. Now, "Geochemia" faces the challenges of the free market and has to improve all aspects of its services.

Down are specified the functions of actors on the stage of geological researches before reorganization, challenges of the new objectives and constrains, and selected approaches to solve problems.

SETTING THE STAGE

The Role of Geology Research Team

Geological researches are executed in two cases: according to the annual plans for comprehensive screening on the territory of the country, and according to a particular project - detail investigation on a given area to evaluate parameters of the existing mine.

Research starts with screening of the information about the area and planning the research activities. Next is the screening of the field, which includes collection and evaluation of samples. According to the achieved results, the team plans next steps. This process continues until fulfillment of the stated objectives of the project.