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The Informatic System—a Modern Instrument in the Management of Education

The design, implementation and development of an information system using statistical data bases within the Romanian department of education is described.

In some prior papers the technical sides of the design including the new character inverted files were described.

In the present paper it is stressed the important involvment of the organizational work necessary to achieve an objective as big and difficult as the information system of one complex department of the government.

Nearly a quarter of the population of the entire country is involved in the educational activity, in a form or another; millions of students, several hundreds of thousands of all-grade teaching staff, tens of thousands of schools from kindergartens to universities — all this gives only a quantitative image of the complex problems of the management of education in our country. In reality, the complexity of the management of the educational process at all levels is ever more manifest, surpassing the problems put by the quantitative aspects which are extremely significant by themselves.

In the context of the ever more impetuous development of the national economy, as part of the implementation of the objectives of the multilaterally developed socialist society, precise tasks, extremely complex and in a continuously developing dynamics are incumbent on education as regards the training of labour force in all fields of activity. The complex aspects are intervening here not globally but specifically in each stage of development and in each branch of the national economy, the necessity for a scientific and detailed correlation appearing ever more sharply between the needs of labour force in economy and the training of manpower through the educational process. This dynamic correlation is ever more difficult to manage by classical means, requiring the utilization of modern management means and techniques, in the first place of informatic techniques of data analysis,

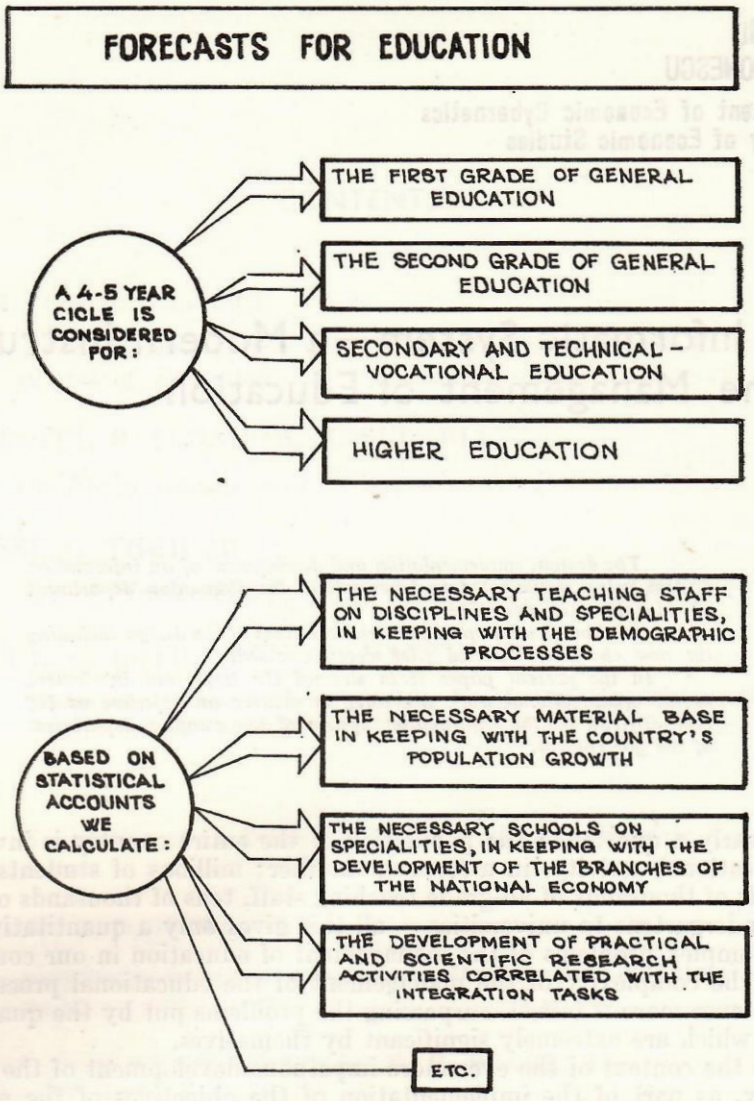


Fig. 1

collection and processing and the obtaining of synthetic information which should allow for decision making.

The necessity for the introduction of a management informatic system in education conspicuously arises also from the internal reasons of the present management system in education and first and foremost, due to the pressing needs of knowing, at every moment, at the level of the entire educational system, the real aspects and essential problems resulting from the multitude of activities, from the detailed changes which are constantly or periodically

occuring at the basic level as regards the utilization of the teaching staff, of the material basis of education, the integration of the students into the educational system, etc.

This allows for the rigorous drawing up, on the basis of ever more precise quantitative estimations, of development plans and of long-range forecasts in education in our country.

At the same time, the current decisions in the management of education can be substantiated more coherently, with the aid of informatic methods of data analysis and processing, by the simultaneous consideration of a correlation of the multitude of quantitative and qualitative factors, which is sometimes impossible to follow in a manual data processing system, because of the big necessities of the processing of data which may result from this correlation.

Linked with the above aspect is the problem of the efficiency of decision-making and the improvement of its quality, a problem which under the circumstances of the present system which is mostly based on manual data processing, is still more difficult to solve. The informatic system for education under the conditions presented above becomes a topical necessity and a requirement of management, expressed as a matter of fact by some normative acts concerning the setting up of data automatic processing units in the higher educational institutions and the designing of informatic systems for the needs of the management of education.

In the following, we shall try to outline in brief the main characteristics of the conception of the informatic system for education forming the objects of activity of a team of specialists and research workers in education.

Major objectives. A first objective necessary in implementing a management informatic system within the Ministry of Education is the correct

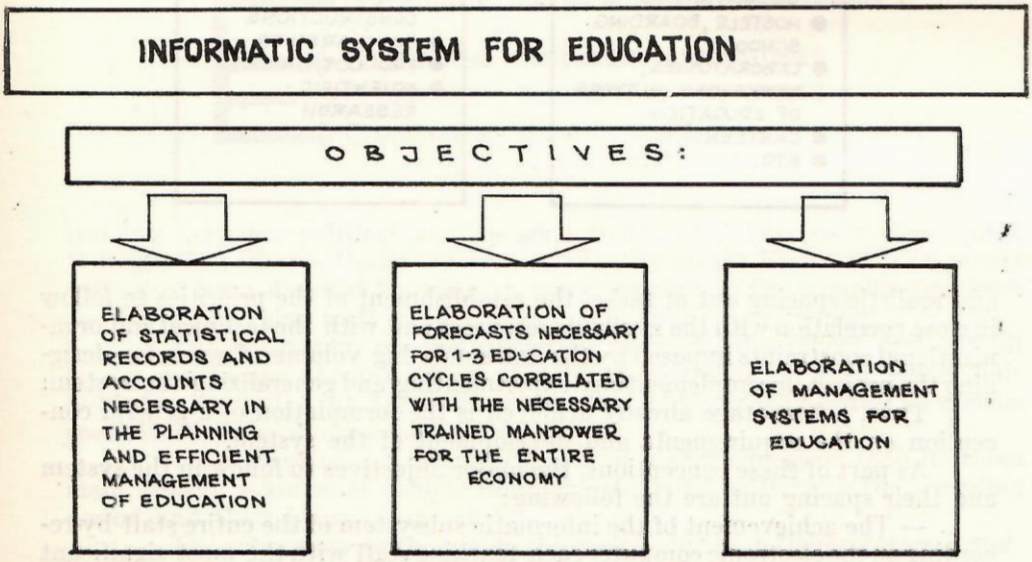


Fig. 1 a

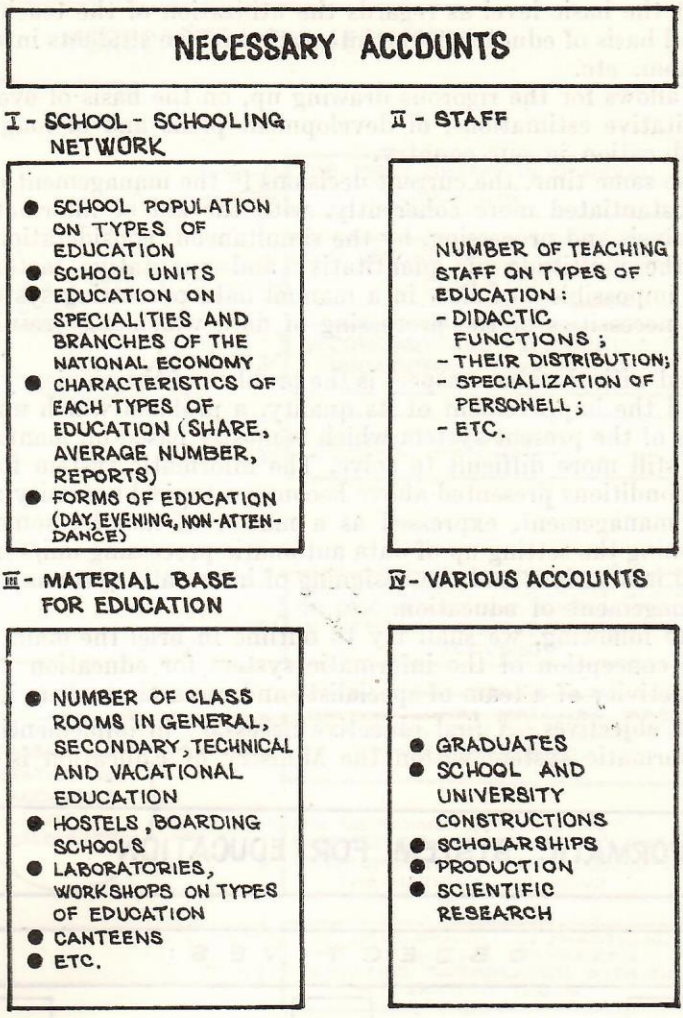


Fig. 2

and realistic spacing out of tasks, the establishment of the priorities to follow in close correlation with the available resources and with the technical and organizational constraints imposed by the extremely big volume of work for designing the project, for implementing, experimenting and generalizing the system.

Thus, a first stage already achieved is the formulation of a general conception on the requirements and development of the system.

As part of these conceptions, the major objectives to follow in the system and their spacing out are the following:

— The achievement of the informatic subsystem of the entire staff by recording on the electronic computer each teaching staff with the most significant personaldata on: professional training, didactic and scientific activity, civil data

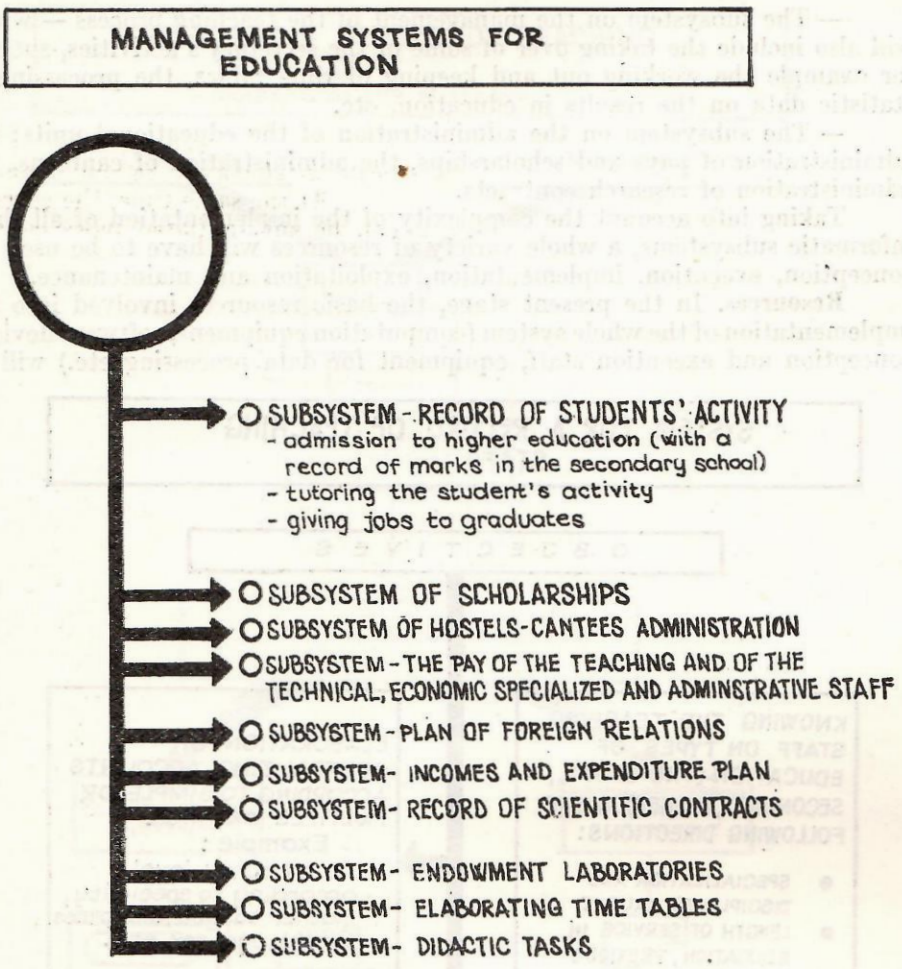


Fig. 3

training activity, political and social activity, etc. This subsystem called M.U.S.C.E.L. (Stable Unified Coding of Identity on the Electronic Computer) will allow for a detailed knowing at every moment of the complex problems put by the teaching staff in all types of education in our country.

— The subsystem on the education network (the school units at all levels) comprising the processing of data characteristic of each school unit (schooling capacity, the degree of employment of the teaching staff of various specialities, data on class rooms, etc.).

— The subsystem on the registration of higher education with its three main aspects — entrance examination, the students' activity in the schooling period and their being given jobs).

— The subsystem on the material basis of education (laboratories, installations, equipping problems, etc.);

— The subsystem on the management of the teaching process — which will also include the taking over of some of the secretary's activities, such as for example the working out and keeping of time tables, the processing of statistic data on the results in education, etc.

— The subsystem on the administration of the educational units: the administration of pays and scholarships, the administration of canteens, the administration of research contracts.

Taking into account the complexity of the implementation of all these informatic subsystems, a whole variety of resources will have to be used for conception, execution, implementation, exploitation and maintenance.

Resources. In the present stage, the basic resources involved into the implementation of the whole system (computation equipment, software devices, conception and execution staff, equipment for data processing etc.) will be

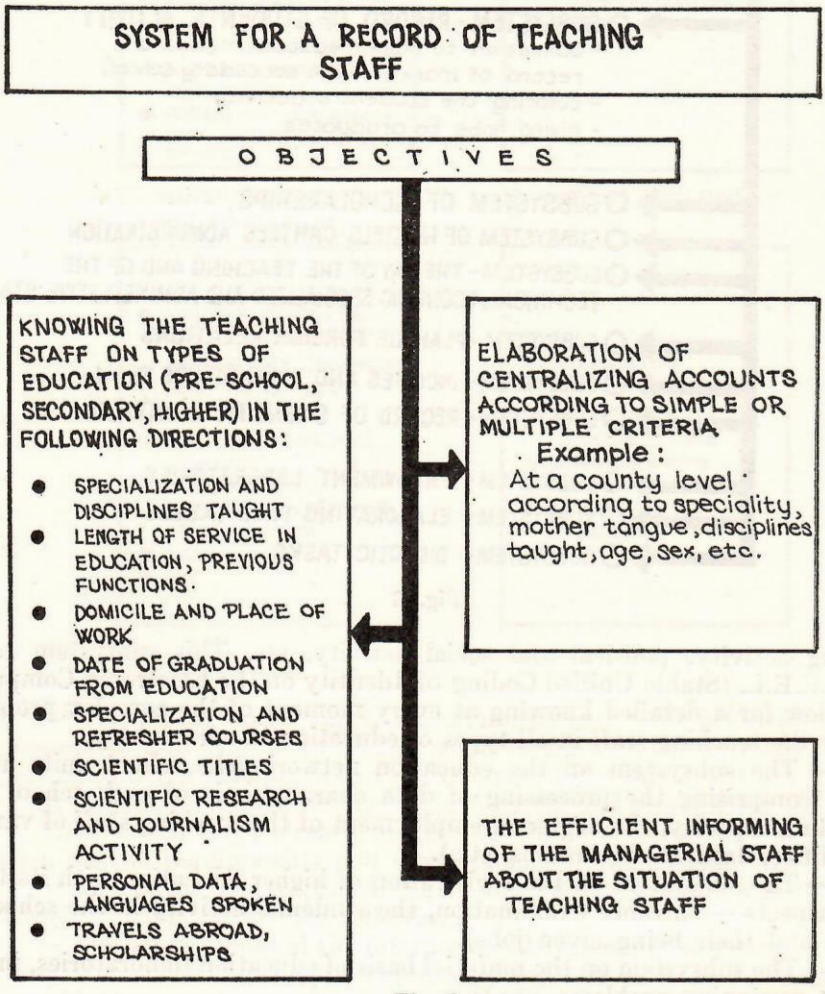


Fig. 4

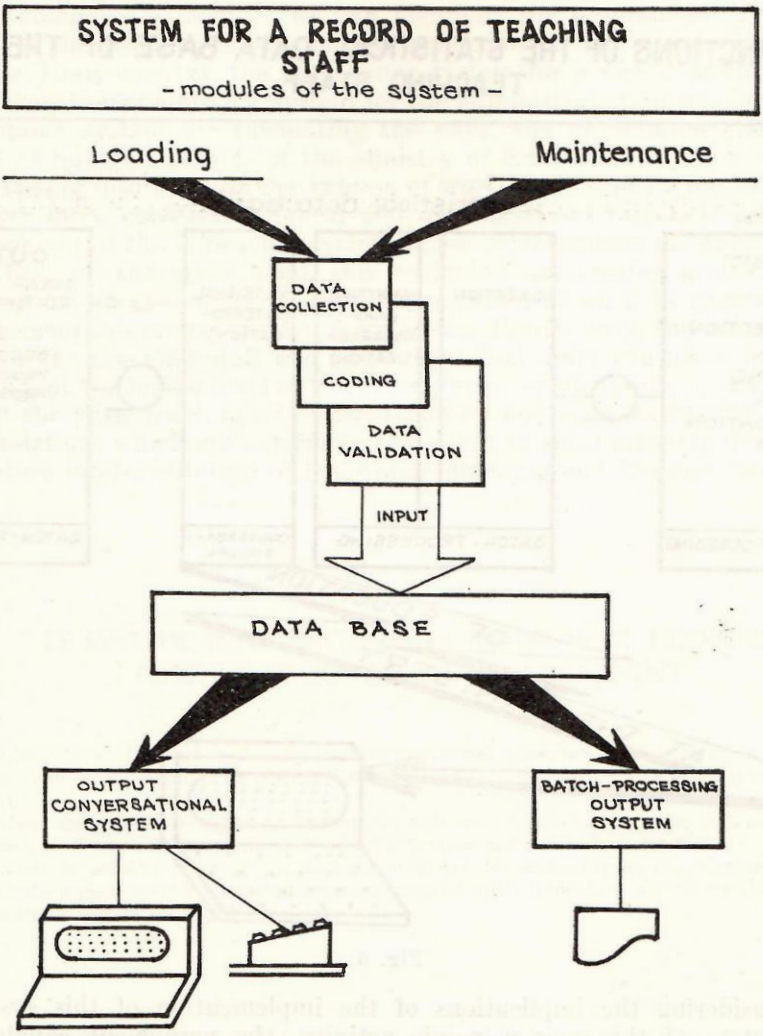


Fig. 5

supplied by the computation centres of the higher educational institutions in several university centres.

In this respect, members of the teaching staff and researchers belonging tot the specialized staff, the students in the period of the integration activity are gradually involved into the implementation of this system in stages.

Of particular importance in the present stage and of a decisive importance in the final stages in the coordination of the entire activity by an informatics compartment of the Ministry of Education and the drawing of the county school inspectorates into the design and implementation of the system, especially for the subsystems meant for a central or county level (the teaching staff and the network of educational units).

FUNCTIONS OF THE STATISTICAL DATA BASE OF THE TEACHING STAFF

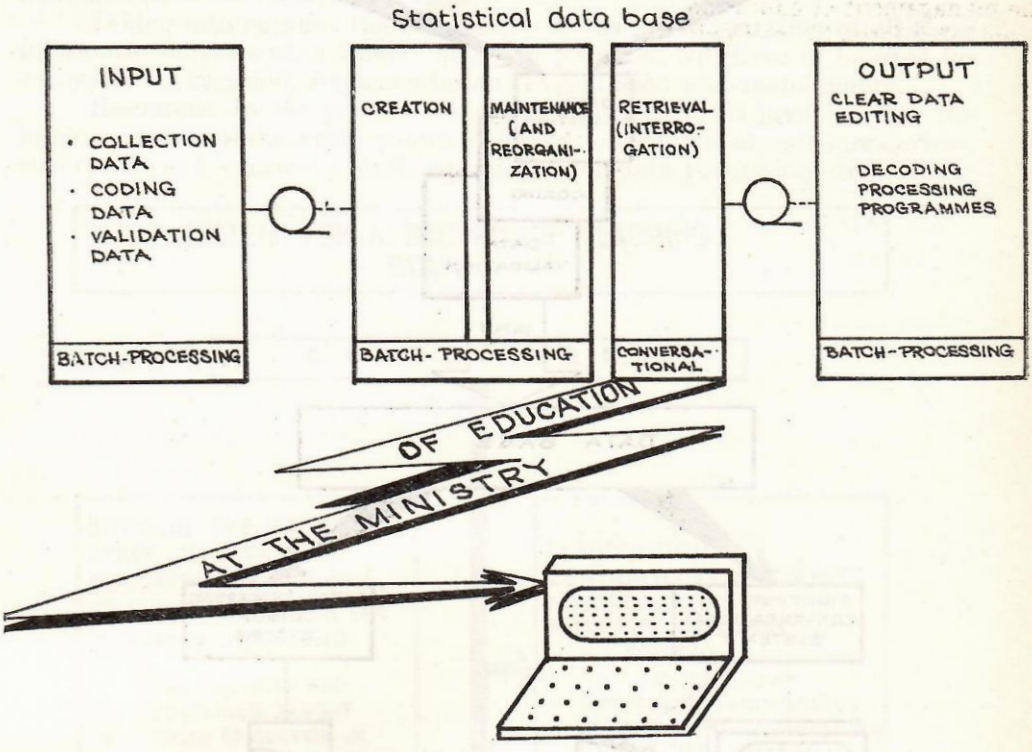


Fig. 6

Considering the implications of the implemention of this system in other sectors of the socio-economic activity, the permanent collaboration with the Central Board of Statistics, the Central Institute of Informatics and Management and the economic ministries is absolutely necessary.

The gradual building of this complex system has started in stages, a number of problems being finalized, from among which we mention the following: the general concept of the informatic system for education has been elaborated; the technical structure of the system has been designed, centred on the utilization of data bases of its own and of exploiting subsystems; the responsibilities for the execution of the subsystems and those for the coordination of the implementation of the entire system were also established; a number of modules of the informatic subsystem for education are being implemented their generalization being prepared, some of them being already in current exploitation.

Among these modules we can mention: the programme system for a record of the teaching staff (the data collection having already been carried out, for Timiş county), the programme system for a record of the students' admission, the programme system for the administration of scholarships, the programme system for calculating the pays, the programme system for a record of foreign relations of the Ministry of Education.

Taking into account the volume of work implied in its implementation, the ever more complex technical and organizational targets to occur in the development of the informatic system, these achievements are only the beginning. But, on the other hand, this beginning has created a starting basis, allowing for an ever more efficient organization of work in generalizing the management informatic system in education. Particularly, the use of the data base for the teaching staff and the educational units will allow for a better knowing, at the higher level of the management of education, of the real situation at the basic level, in its entire dynamics and complexity with a number of correlations which are extremely important in substantiating decisions and the future implementation of long-range planning and forecast targets.

10.10.1976

LE SYSTEME INFORMATIQUE UN INSTRUMENT MODERNE POUR LA DIRECTION DE L'ENSEIGNEMENT

Les auteurs donnent la description des problèmes généraux de la projection, de l'implantation et du développement d'un système informatique au Ministère de l'Education et de l'Enseignement.

Dans quelques ouvrages antérieurs, les auteurs décrivaient les aspects techniques de la projection, y compris la nouvelle méthode d'inversion par caractères des fichiers

Dans le présent ouvrage on met en évidence les importantes implications du travail d'organisation nécessaire à la réalisation d'un objectif aussi important que le système informatique pour la direction d'un ministère.

ИНФОРМАЦИОННАЯ СИСТЕМА ДЛЯ ОБРАЗОВАНИЯ

В работе дается описание общих вопросов проектирования, внедрения и развития информационной системы Министерства воспитания и образования.

В некоторых предшествующих работах были описаны технические аспекты проектирования, в том числе и новый метод инверсии по особенностям картотек.

В статье подчеркивается важность использования организационной работы, необходимой для осуществления такой важной цели, какой является информационная система для руководства министерством.