

# INTRODUCTION OF MODERN METHODS OF DISSEMINATION OF STATISTICAL INFORMATION

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## Abstract

This article considers the problems of user access to statistical bases and databanks, comprised the state statistical information resource. It also suggests ways to improve the dissemination of the summary statistical information by state statistics bodies, shares experience of National statistical committee of the Republic of Belarus on design and implementation of the information systems providing access to statistical databases, including Internet usage. The article also presents the level of introduction and use of geographical information systems (GIS) in state statistics bodies of the Republic of Belarus, including dissemination of statistical information. The purposes and the main stages of further development and of introduction of GIS in statistical practice are given.

## 1 Introduction

Importance of statistical information constantly grows in modern society because such information becomes one of key resources in political, social, economic and scientific activity of mankind. Statistical bases and databanks form the state statistical information resource and are the main source of reliable statistical information in our country. At the same time there is a problem of the limitation of the user access to information elements of this resource. Therefore one of the directions of development of Belarusian state statistics is improvement of the statistical information dissemination system for providing the user access to summary statistics organized as databases and databanks, including the Internet access.

For the purpose of providing a sustainable and uniform development of the state and its certain regions in the Republic of Belarus the relevant policy is realized. There is need of the statistical information detailed to necessary territorial level availability in this aspect. The importance of such information is tremendously increasing if it's charted on the geographical maps. The join of statistical information with maps is also necessary for statistical modeling and the analysis in territorial aspect. Therefore improvement of Belarusian state statistics is directed on implementation of the geographical information systems (GIS) in statistical practice. Its necessary for planning and the organization of state statistical observations and for dissemination of statistical data on a cartographical basis using the Internet.

## 2 Dissemination of information organized as statistical databases and databanks

In the Republic of Belarus the state policy on collecting and processing of primary statistical data, dissemination of summary statistical data on economic, demographic, social and ecological situation in the country is carried out by National statistical committee of the Republic of Belarus (Belstat). Statistical information and publications are disseminated to users including the Government of the Republic of Belarus, bodies of the public and regional government, the ministry and department, research establishments, a business community, society. Annually Belstat forms hundreds analytical papers, statistical bulletins and books. The majority from this publication is available to a wide range of users by publishing of the electronic version on the official Internet site of the Belstat.

At the same time, these publications contain pre-determined statistical and analytical material which often doesn't satisfy information needs of users. In order to carry out the profound social and economic analysis with application of the advanced methods of statistical modeling and analysis it is necessary to prepare statistical material specifically. The user can address with special inquiry in state statistics bodies and obtain such information. It generally demands construction of a special request for the retrieval of information from statistical databases. In turn, this work is extremely inefficient because it demands essential time expenditure and involvement of experts in the information technologies field. In other words, today there is a problem of limitation of user access to statistical databases. The solution of this problem seems in improvement of approaches of dissemination of summary statistical information by state statistics bodies. One of the directions in this aspect is the design and implementation of the information-analytical systems intended for the organization of effective user access to statistical bases and databanks, including through the Internet.

Belstat already took the first steps in this direction and developed a system providing Internet access to the database of aggregated data of the 2009 population census. The base has subject orientation and is developed according to methodology of creation of multidimensional data storages (Data Warehouse). The storage contains summary information on thematic blocks of population census: population and its territorial placement, its demographic, social and economic characteristics, education level and national structure, migratory activity, living conditions, number and structure of house farms. Information is stored and can be quickly taken by the user in various dimensions (thematic cuts), and in their any combinations. In territorial aspect information is detailed to the settlement. The storage is organized using connected to the Internet server. Access of users to information is organized by means of the special software tool of the Business Intelligence class (BI).

Access to the system is organized through a special banner placed on the Belstat's official site. Users of the system can work with analytical panels, whereby he can choose an indicator (for example, population), install filters (for example, rural men at the age of 20-24 years, having the higher education) and receive information in the necessary dimensions (for example, the territory). The result of inquiry can be

presented in the table, the chart or on the card. Data can be unload in the necessary external format (for example, Excel, Pdf). The special creation mode of analytical reports is intended for building of more difficult inquiries. In this mode the user can change inquiry structure in an interactive mode or obtain information detailed to small territorial units.

This system develops from the point of view of information filling. Today annual data on the main indicators of demographic statistics (population, number of the dead and number been born, number of marriages and number of divorces) in various thematic cuts are available to Internet users in an interactive mode. Access to the population census data of 1999 is also planned to organize.

In the near future the data obtained by results of other statistical supervision will extend by the same principle. Now within introduction of Integrated Information System of State Statistics of the Republic of Belarus (ISS) the integrated statistical information resource is formed. One of its components is the macro-database, which contains aggregated statistical information. This base is organized according to methodology of creation of multidimensional data storages also. User can choose the necessary indicator, values of social and economic classifications (dimensions) and extract information. The catalog of statistical indicators is a basis of metainformation of the macro-database. At the heart of this catalog creation was put the scientifically reasonable approach of indicator structuring on the basis and the attributive part. The indicator attributives form changeable part of an indicator and is allocated in uniform directories.

At the moment access to the macro-database is possible only to the staff of the state statistics bodies. Within development of ISS Belstat plans to migrate macro-database on the connected to the Internet server and integrate it with the industrial BI tool. In this case Internet users will be able to form inquiries to base in an interactive mode and receive necessary statistical information.

### **3 Introduction in statistical practice of geographical information systems**

In the Republic of Belarus the state and regional programs of a sustainable development were accepted. Problems localization and the analysis of demographic and social-economic development of concrete territories of our state are necessary for successful realization of these programs. Efficiency of decision-making directly depends on existence of the reliable statistical information detailed to necessary territorial level. Importance of such information significantly grows in a case of its presentation in a binding to a cartographical basis.

Thus far Belstat took concrete steps for introduction of the geographical information systems (GIS) in statistical practice. In 2010 on the basis of the cartographic materials created for needs of population census of 2009 the GIS Census was designed and put into operation. This GIS contains the digitized contours of administrative and territorial units and other territorial units of the Republic of Belarus (for example,

rural settlements, census areas, city blocks). By means of this system the distribution of results of population census of 2009 was provided in the form of the thematic atlas.

Now Belstat uses the GIS tool for the organization of the household sample surveys. The GIS is used for dissemination of demographic and social-economic statistics in the cartograms form. Information is presented at the level of the administrative-territorial districts of the Republic of Belarus (for the reference: Belarus consists of 6 regions and the Minsk city and is territorially divided into 118 administrative-territorial districts).

- introduction an addresses layer with providing a binding of each object of this layer to concrete coordinates (geocode) in the statistical GIS. Development of the GIS in this direction assumes collaboration with the organizations which are carrying out cartographic and geodetic activities in our country. It is necessary also for ensuring continuous updating of spatial data. Full-scale statistical GLASS will allow to use paperless technologies for carrying out population census of a round 2020 and to provide dissemination of census results in a level of the small territorial units;

- elaboration and introduction of methodological approaches of obtaining statistical information in a level of the small territorial units. For this purpose, on the one hand, it is necessary to create the list of the statistical indicators for the analysis of development of territories, to define a circle of users of such information and the methods of its granting. On the other hand, in order to obtain primary statistical information bonded to specific coordinates (geocode) it is necessary to revise existing approaches of the organization and of carrying out statistical supervisions. The information linkage to the digital card (including concrete coordinates) will allow to receive and to disseminate statistical data in a section of small territories, to carry out spatial modeling and the analysis in the environment of GIS;

- technological support of GIS and use of modern information technologies and of the consistent approaches for a jointing of statistical information to a certain district. In order to assure interactive access to spatially distributed statistical data for Internet users it is necessary to design and implement a statistical GIS-portal. It is one of the perspective directions in this aspect.