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Topic (iii): Internet and Intranet solutions

**USE OF GEOINFORMATION TECHNOLOGIES ON INTRANET**

Submitted by the Agency on Statistics of the Republic of Kazakhstan<sup>1</sup>

**Contributed paper**

1. The information environment of statistics in the Republic of Kazakhstan consists of information systems, technologies and telecommunication systems functioning according to common principles. These specify the information interaction between all components of the statistical system, and the ways to meet the information requirements of the users of statistical information.

2. The Information and Computer Center of the Statistical Agency is now focusing on the development of the information systems. The aim is to improve the storage of statistical data and to integrate it with a geoinformation system which permits the visualisation and analysis of the data. For this purpose, the various types of information servers (e.g. SQL-server, Web-server) located on different sites of the computer network of the Statistical agency are integrated. The geoinformation system for processing the spatial-temporal data will be connected to them. For example, the Intranet-server which became a major resource for distribution of corporate information is created on the base of the Internet Information Server and SQL Server. Due to the integration of various technologies, the users have the added possibility to carry out a fast review and analysis of data represented as maps, tables and diagrams. This is possible through the "Dynamica" subsystem.

3. The "Dynamica" is a data bank of indicators. It can be called an electronic archive, because here are stored the dynamics of changes of main indicators in all branches of statistics. Modern information technologies were used for its development so that statistical data could be created, stored, processed and efficiently disseminated to customers.

4. A core of the system is the database controlled by a database management system on Microsoft SQL Server. About five thousand types of indicators from different statistical areas for each region of Kazakhstan are stored in this database. Each indicator has a unique code. The database structure includes the code of a statistical indicator, value of an indicator, date and code of the region. The base contains a classification of indicators and of regions. The database is updated with new data once a year after the processing of annual statistical reports is completed. At the time of writing, the database includes data from 1990 to 1998, e.g. two indicators belonging to the branch "Trade and services" included in this database are:

- i) Volume of domestic services rendered to population in rural areas;
- ii) Trade turnover on sales of food products.

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<sup>1</sup> Prepared by Alionora Kosyanenko.

The description of indicators, list of indicators in the database, the methods of access and exchange of information, and the order of updating are represented as a metainformation.

5. The "Dynamica" database is accessible to the user via Intranet. The user has access to a Web-site created with Frontpage 98. The information presented on the Web-site is prepared with the help of desktop cartographic software MapInfo. The user can view the information in any number of windows of three types: windows of Maps, Tables and Diagrams. The technology of a synchronous data representation permits the simultaneous opening of several windows containing the same data, and the change of data in one of the windows is accompanied by automatic change of these data in all other windows. The software does not just simply process the data, but can visually represent them, giving a general overview to the user. All data contain a geographical component (name of the region). The user can draw a sample from the data for different years by different regions of Kazakhstan and can view and analyse these data on a map.

6. The regions displayed are marked with different colours, and charts (e.g. pie charts, columns) are placed in the centre of each. Every statistical indicator is represented by a mini-graph, adhered to the centre of each region of Kazakhstan, and which permits the analysis of changes of a statistical indicator. By comparing the sizes of columns, we can estimate changes in the value of a given indicator for different years. The colour of each column on a graph corresponds to a selected statistical indicator, i.e. it is possible to create graphs with several separate columns for each indicator, with columns imposed one upon another, or with calibrated columns (where the width of columns is proportional to the value).

7. The pie charts display and analyse values of several indicators simultaneously for different years. These maps can represent all Kazakhstan for comparison of data for different regions. The user has the possibility to export the output data in the format of tables (Excel), to generate the analytical tables in an arbitrary form with the help of the tabular processor, to run any query for the data and to print out its results. The most frequently requested data tables are published periodically on the server, accessible to the external user on INTERNET. In the long term, it is planned to improve the design of the site, and to make the information related to the dynamics of indicators accessible to the external user via INTERNET.

8. The MapInfo system combines advantages of data processing (including a powerful query language SQL) with visualization of maps, schemes and diagrams. Data can be accessed directly from MapInfo using queries, including from remote databases. MapInfo combines effective resources for the analysis and representation of data. From the MapInfo system it is possible to directly access the files created in dBASE, FoxBASE, Excel, Access, ASCII with separators, Lotus 1-2-3, and also the remote databases through the connected tables. It is also possible to import graphics files in various formats, and to create database files in MapInfo. Such a multifunctional system permits the extraction of data from various databases, and gives the user the possibility to analyse the data and to visualise these data on a map.

9. At present, the system described above is at the design stage. A preliminary demonstration of its possibilities has been approved by users, and we hope that during the next year we will successfully complete its development and implementation.