METHODS OF CONVERTING A PAPER MAP INTO AN ELECTRONIC MAP

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Annotation: Currently, information technology has developed in all areas of our Republic, including residential areas and agricultural enterprises, to such an extent that the improvement of cadastral work in them has become a demand of the times. New modern tools and software are needed to create digital maps. In addition, Panorama and ArsGIS 10.8 programs, which are currently used in production, are very useful for creating new digital maps. Digitization is the process of converting ordinary (paper and analog) data into a digital form that can be stored in a computer system.

Keywords: Panorama, RAM, raster, vector, map, projection, attribute.

There are a number of technical methods for converting a map printed on paper into an electronic map. They differ from each other in terms of code and file structure. In addition, the structure of information in the geographic information system, created in different ways, also differs from each other. In a computer, data is stored as a physical structure and is almost tangible. This physical structure or structure represents the disk and RAM (RAM stands for Random Access Memory. It is a type of computer memory that allows rapid access to data in any random order) parts of computer memory, and cartographic and attribute meaning in files and directories. shows the path in which data is stored and retrieved.

According to its logical structure, the data represents geographic details, and so far in geographic information technology, there are 2 models of map data (raster and vector) and 1 model of attribute data (simple file).

In the raster model, the main idea is to store data in cells or cells arranged in a certain order. As an example of such a model, we can cite coordinate grids on the map. The information in each cell is stored as a whole, and the size of the cell indicates the detail of the information. As the size of the cell increases, the detail decreases, so this indicator of the cell should be chosen carefully. The information in each cell will have its own amount. For example, the height of a place indicates the type of soil or vegetation. The size of a grid is called its resolution, and the quality of satellite images is evaluated by this measure. For example, when it comes to image resolution of 24 meters, the size of the cell is equal to 24x24 meters, and details smaller than 24 meters cannot be distinguished from each other. The advantage of this model is that it is easy to understand, analyze and display.

In the vector model, the image consists of points, and each point is represented by its coordinate. Based on these coordinates, which are stored in a separate list, it is possible to study a point and make shapes from points. The order of the points indicates the order of the shape to be made. This model is very convenient for storing and managing information about linear objects, and for performing various calculations. It takes up less space in the computer

memory and helps to sort the stored data. In the raster model, even if there is no information in the cell, we have to store it in the computer memory. And in the vector model, only the information about the necessary points is stored, and the lines are made with high accuracy.

Attributes are stored in table format. Information is written in each row and column. The work performed in the database can be explained as follows: all available data are checked line by line until the required information is found. And in sorting, the rows are numbered differently. Placing a frequently encountered entry at the beginning of a file increases efficiency. Database management systems are designed to do just that, and they also do the job of keeping records organized. Storing data in one place, managing their order, etc. is the service of database management systems.

Attribute sorting creates a list of all existing attributes and lists all existing pointers and writes them to each individual file or at the beginning of the file. The difference from other information is that the map is 2-dimensional, and the details in it are represented by coordinates on the surface of the earth and on the map. As we have seen above, a point is a base element stored in the computer memory, and various other shapes are created based on it. The number, sequence, and location of the points affect the correct construction of the line and area. The order of data depends on the model used, and the choice of this model has a great impact on the work of the geographic information system. In addition, the nature and amount of errors and the type of map created depend on the selected model. The geographic information system can work with structured data of different models, but during work, structured data of one order is required for finding data and analyzing them.

Creating a database in geographic information systems is the main problem, because the cost of creating a database accounts for 80-90% of the cost of the project. This is a costly and time-consuming process that is not without errors. The experience of using geographic information systems shows that with the creation of a database, there is a risk that all work will be completed, and this database may not be used for analysis. In order to increase productivity, it is necessary to look for ways to reduce costs and increase accuracy.

The problem of automating the process of data creation is one of the most urgent problems today, and it is not fully resolved in modern technologies. There is a lot of extra work involved in building the database, which leads to increased editing. Resources need to be redrawn to meet automation requirements. In order to reduce costs, attention is being paid to improving the methods of creating resources and efforts are being made to find other approaches.

One such approach is to create a data sharing system. In order to create information in geographic information systems, it is necessary to encode information about the location of objects and their attributes. The location of objects is usually encoded in a plane coordinate system and stored in computer memory as a set of "x,y". When carrying out such work, several problems arise due to the fact that the sources are created at different scales and projections. To bring the sources to the same coordinate system, it is necessary to perform several mathematical calculations (transformation) and, as a result, it takes more time and the cost of the work increases.

Several methods are used to convert maps into electronic maps, and they differ from each other due to the tools, tools, approach, and methodology used. The resulting information also differs in its characteristics.

When entering attributes into the computer memory, the keyboard is mainly used, and the necessary information is directly placed in the appropriate tables.

The basic paper map was converted into an electronic map in the Panorama program.

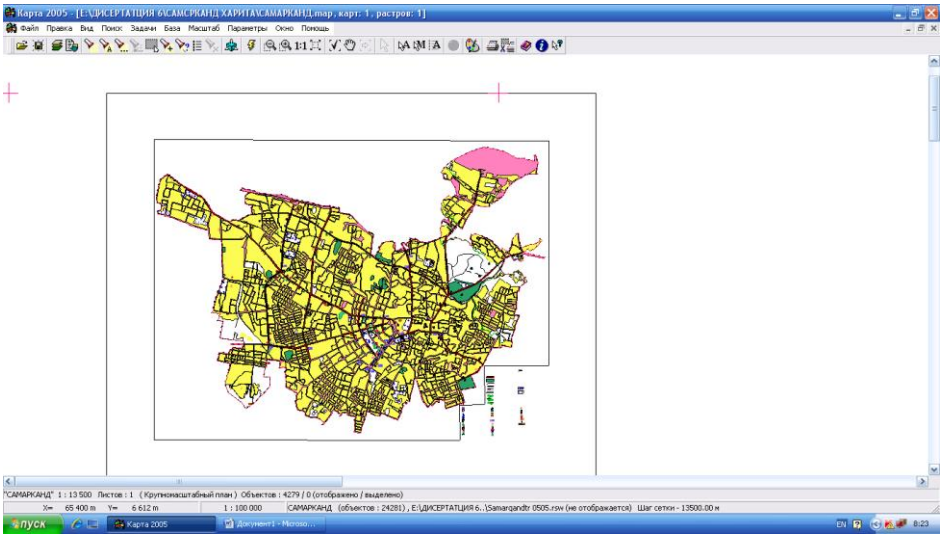

Figure 1. Electronic map of the city of Samarkand

We drew the map in the Panarama program at a scale of 13500 and then redrew it to turn it into an electronic map. The convenience of this electronic map is that we can get information about the desired historical monuments from the map itself.

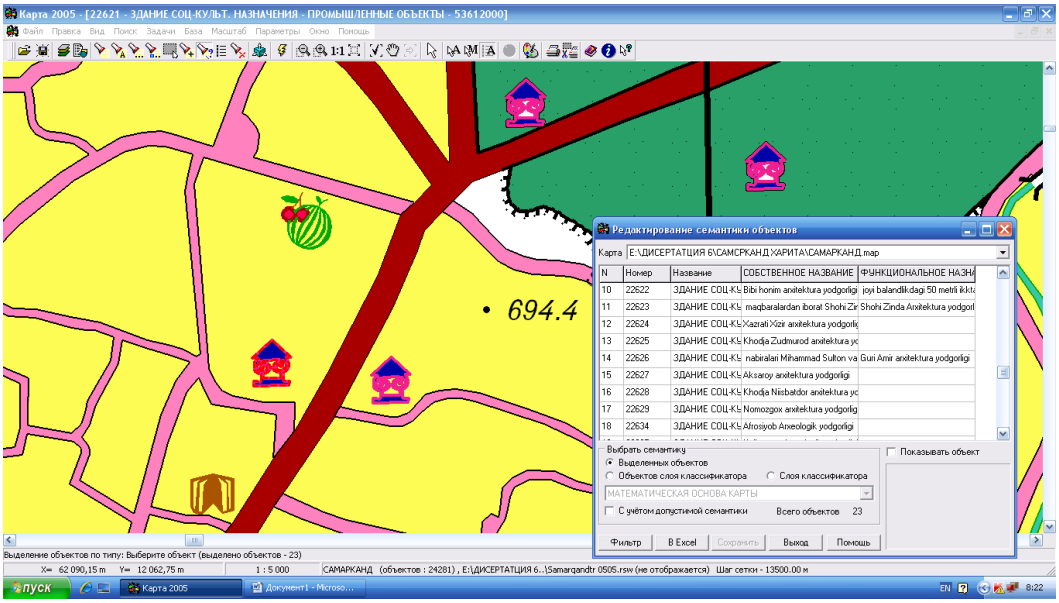

Figure 2. Get information about historical monuments

Or, if we want to get information about the city of Samarkand, then we click on the conditional symbol of the border located on the border of the electronic map of the city of Samarkand.

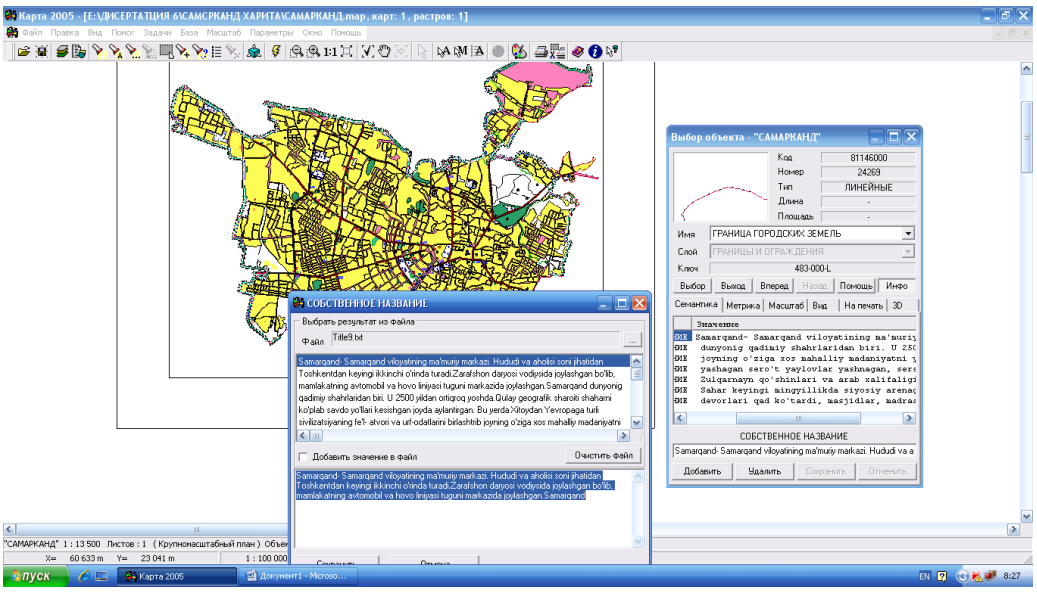

Figure 3. Get information about the city of Samarkand

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