# INTEGRATION OF GEOINFORMATION AND PUBLISHING TECHNOLOGIES FOR CREATION CARTOGRAPHIC SEARCH SYSTEM "RUSSIA" (WITH USE THE ELECTRONIC MAP OF RUSSIA OF SCALE 1: 5 000 000)

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Novadays software for management the cartographical data are GIS and multimedia information systems. The basic differences between them consist that in the first case the expert has business with the complex program interface for creating, editing, analyzing the geographic data, whereas in the second mass user through the simple friendly interface takes the prepared cartographic information. At the same time, that the mass user could use the information, multimedia cartographic information system should have some opportunities GIS, namely: to take the information from a database on inquiry and to have measuring and statistical functions.

Thus, the flowchart creation data for multimedia cartographic information system has the following kinds: creation the vector data and attributes in GIS, design of the vector data according to their attributes in desktop publishing systems and then - creation of multimedia information search system - connection of the cartographic data with slides, video, audio, additional textual and other illustrative information. Now the cartographic information search system "Russia" is created. It consists of several functional blocks: the electronic maps of Russia – cities, subjects of Russian Federation etc; the illustrative and text information data about Russia. The technology of creation of an electronic cartographic system is based at the integration of GIS and multimedia means. The data was obtained in GIS, where the spatial objects are organized in graphic databases having rigid connection with attributive database.

The very simple management of the cartographical information will allow to use this electronic maps at the lessons for geography of Russia.

GIS and multimedia differ on complexity of the interface and data management. That the mass user could extract the cartographic information multimedia system should have some capabilities GIS and at the same time have simple control. Thus, the new means of creation of maps find the application in educational technologies.

The electronic textbooks, encyclopedia on different branches of a science already for a long time not a scarcity. At the same time, many from similar electronic manuals contain the items of information from the usual textbook with difference that the information is submitted as the hypertext and is accompanied by digital images. However, the reading of the volumetric texts from a screen of the screen monitor admits as most wrong for sight by activity with the computer. Therefore electronic educational programs should contain a minimum of the text, but the maximum of the visiblis and sound information - as in computer games, where the user is involved in active operations. Many of the visiblis cartographic information optimizes learning process of the schoolboys, and the controllability of the mapping data put in the fundamentals of an educational course, stimulates their activity during a lesson of geography.

The essential role in creation of the educational system plays development of the flowchart ("«script") representation of sections of a course. It can be built pursuant to any of the textbooks on geography, supplementing the various items of information, which were not including in a basis course. For example, the theme «Administrative device of Russia» can be studied viewing electronic album of ancient maps Russian district and cities that will be consist in the system. The problem of creation of an educational course on geography consists not only in formation of the methodical approach to the mapping information, but also in its collecting, systematization and storage limited only to hardware resources. As an electronic multimedia geography course is based on digital base of the cartographic data, it can be used as a search system.

The cartographic information search system consists of several functional units:
 - Cartographic information;
 - Not cartographic information data;
 - Facility controls;
 - Means of navigating at the system.

The main unit - cartographic information - is a set of integrated maps of the different contents and scale. Now system consists of two basic elements: the administrative and geographic maps. In future it is updated and added other cartographic materials and schemes. Both base maps determine specificity of initial accumulation of the not cartographic data. The unit of the not cartographic information data consists of illustrative (slides, photo and video data), the text (help, comment, summary) and also voice and musical tracking "linked" to the mapping data.

Multimedia geography course is formed with usage electronic versions of the school maps of Russia of a scale 1: 5 000 000 prepared for creation paper map. It consists of two sections: «Administrative device of Russian Federation» and «Nature of Russia» just as named printed versions of the school maps. The compatibility of the electronic and printed versions is guaranteed by the using of common initial materials, by the unified technology and the unity of the version content, by the transfer of the files of the electronic version for creation of the printed version. Both versions have common technology according to developed the editorial and preparatory works.

The following materials are used:
1. Digital layers in GIS project, prepared as the result of scanning and vectorization of the initial authoring layout, and attributive database;
2. The designing of the maps with symbolizing of the objects according with data classification for each basic maps (the sets of map symbols, tables, diagrams, texts, names, frames and out-framing get-up), prepared in the result of treatment of the digital layers converted from GIS to the publishing system;
3. The raster images (the ground image, the reproductions of the old maps and so on) in the TIFF-format with the resolution not less 300 dpi. The ground image is scanned for the using as in printed version and in electronic one. The colour correction is used for this image. The files with the photos, processing by this way, are transmitted for the designing of the maps.
4. The text materials (the text issues, the geographic references, the annotations to the photos, indexes, the statistical information, the output data and so on) composed and edited as metadata.

The creations of the maps is based on the following principles:
 - the accordance to the international and national standards for the geoinformation;
 - the accordance to the automatic information systems;
 - the creation electronic maps in Russian and English version.
The software facilities are ensured creation map in electronic and printed version, the transfer of the vector files from GIS to publishing and multimedia system, the colour correction, the forming electronic prototype. They includes:
- the Windows 98 software;
- the special software for vectorization initial materials (MapEdit; Easy Trace);
- the software for editing of vector map data (GeoDraw/GeoGraph; ArcInfo/ArcView);
- the special software for conversation vector layers from GIS (MAPublisher);
- the publishing software: PhotoShop, Adobe Illustrator, Adobe Acrobat.

The geographic-information project was the base for the creation of the electronic and printed version of the maps of Russia and the forming of multimedia cartographic system. The geographic information version in comparing with other versions has the spacious data base, updated regularly, the extended software shell, working in the certain operating environment and permitting to conduct the different operations with the cartographic and other information (simulation of the processes and situations and so on).

The design and manufacturing of the software facilities for management electronic information search system "Russia" are developed in the process of creation electronic version for the printing of the maps. Now the prototype of the information search system "Russia" was created on CD-ROM's. Vector and raster images, texts, reference data bases are loaded into electronic prototype of the user's shell. The database, which is included necessary information about the objects, imaged on the maps, is linked up to the objects. The user's manual and the brief description of content published as PDF-file would be added to the full version.

The differences between electronic version of the maps and prototype are:
- the existence of the data base, which is included the more reference data in comparing with the electronic version for printing, for example, the data about geographical objects from the statistical hand-books and encyclopedia;
- the possibility of including of multimedia effects (animation, sound);
- the possibility of realization of operations for data management.

So the electronic prototype of the information search system "Russia" can realize:
- the scaling of image;
- the increasing and decreasing of the image by the window (zoom);
- the determining of the distances and areas;
- the determining of the geographic co-ordinates;
- the receiving of the cartographic information about the object, selected by the user (from the databases);

The system is guaranteed the search:
- maps (according to names, schemes of disposition, the most important geographic objects);
- photos (according to names, to the attaching to objects), parts, for which there are the photos;
- the text information (according to titles, themes, attaching to objects and sheets of maps).

The information from the prototype represented as the images of electronic map or other element of content, fragment of map or single layer of map. The electronic prototype of the information search system "Russia" is functioned in the next modes of operation:
- the reading from the screen of display;
- the executing of above mentioned operations;
- the output on printer.

The development of modern computer technologies provides new capabilities for representation of scientific, reference and any other information. Integration the graphic information and text in a combination with acoustic and video effects allows to create intelligence systems, simple, attractive to the mass user. The special role plays the spatial data - electronic maps. However software of managing of the spatial data - GIS - have the rather difficult interface, not always have developed graphic means of design and visualization and require of the user of special knowledge. The control of the spatial information on the basis of some capabilities borrowed from GIS, with the help amicable for the user multimedia interface is one of ways to expand spatial representations for the mass user who is not possessing special knowledge, for example, schoolboys. Thus, the prezentative-illustrative technologies play in cartography a not less significant role, than usual electronic technologies related to obtaining, editing and storage of the spatial information.