

The Digital Maps' Application in Scholarly Studies in Russia

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The role of geographical factor in the historical processes in Russian state can hardly be exaggerated. There is a huge amount of works considering this important problem. As an example I want to introduce you an analytical review made by Joseph Belenkiy and titled "The Role of Geographical Factor in the Native Historical Process". The geographical factor in historical process and its role as a determinant of the morphology of Russian historical space is under consideration from historiographical point of view in this review. Multidisciplinary approach to this problem and its grounds are also presented. The Review comprises almost 600 items listed in the Bibliographical Index. The earliest of them are of the middle of the 18th c. And of course this is far not the full list. This review shows us that the interest to maps' application in Russia has been steadily high for last three centuries.

And now the problem of GIS arises. One of the main problems is the discrepancy between wills and possibilities of groups of specialists in two different fields: history and mathematics. I am a historian. A sources study is my field of interest. I have a group of colleagues engaged in a sources study. Also I have my narrow space of research. It is the diplomatics of North India in early mediaeval period. Well, when speaking to mathematicians it seems to me very often that they do not hear me, trying to propose not what I want but what they can. I know the possibilities of PC.

Also I am to say that computers are not so widespread in scholarly circles in Russia as they are in America, in Japan, in Taiwan. The vast majority of our scholars having the computers use them simply as a typewriter. Returning to GIS I want to say that we have a group of scholars at our Institute who are developing the entirely new field of research: The Social Natural History, according to which the way of life, type of household, of dress, of food, etc., are dependent of the natural conditions of this or that area. These scholars are a little bit crazy; they use no computers relying only upon their intuition. But their manner of manipulating the data is sometimes strange to put it mildly. That's because they are not narrow specialists, they do not work with concrete subjects, they do not produce information, and they are only interpreting it. As a matter of fact what they are doing could be said to be the approaches to GIS technologies. But I think that they will never cross the border. They will stay just where they are. And I am afraid that these scholars will always be the keen enemies of GIS methodology.

There are a lot of other problems and among them that of money is not the last one.

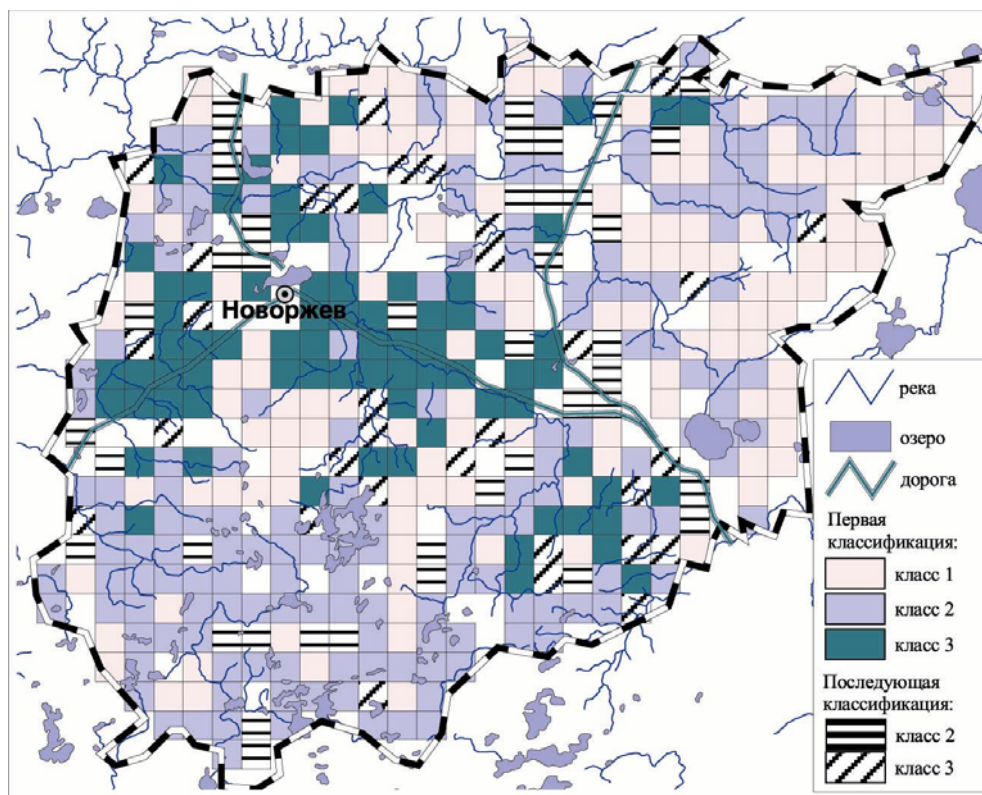
The first approach to GIS can be found on the server of the Barnaul State Educational University at the address <http://bspu.secna.ru/Faculty/History/atlas/index.html>. Site designers say that one can find here a story of the historical cartography of Altai Region including the historical past of this region, its geography, history of map designing of the

South of Western Siberia in 17th – early 20th centuries. But up to the last times there were displayed only several pictures of old maps there.

Another example of more close approach to GIS technologies would be the “Atlas of Kuril Islands. Problems of Development” The authors of this Atlas is the Research group headed by now late Prof. Alexander A. Liouty. The Atlas is prepared in two versions: printed and digital. The content of the printed version develops in 152 cartographic themes and 399 topics of maps that are placed on 330 pages. Structurally Atlas consists of 6 sections: 1. Physical conditions and Geographical characteristics (4 themes, 28 topics); 2. Nature and resources including relief, climate and resources, water resources, soils, fauna and flora, landscapes (103 themes, 307 topics); 3. Population and economics (19 themes, 21 topics); 4. Ecology (5 themes, 12 topics); 5. History. Natural and Cultural Heritage (12 themes, 15 topics); 6. Kuril Islands and Asian Pacific Region (9 themes, 16 topics). The maps of Atlas are organized in 5 scales so that the fullness of characterizing the region might be based in the best way. The work over the Atlas is now in process. The printed version is ready, the digital one is now being created. The whole project is designed for the next 3 years. In the process of creation the digital version of the Atlas its authors use such software as ArcView and ArcInfo for GIS technologies, MicroStation, Free Hand and CorelDRAW for graphic editors and publishing editors. For users the final software product would be ArcView. The retrieval system of the Atlas would be equipped with complex index.

Now I would like to say a few words about the historical studies in Russia that are paying interest to the digital maps’ application. These studies are flowing in two main streams: historical – Russian branch of the Association History and Computer with the conferences under the same title and oriental – Orientalists’ Society of the Russian Academy of Sciences with the conference “Historical Sources of Eurasian and North African Civilisations: Computer Approaches”. Both Association and Society publish special bulletins on the subject.

Within the frames of the Russian branch of the Association History and Computer there were and there are several scholars who use the GIS technologies in their research projects. Among the first Nina Piotukh is to be mentioned. She is working the associate professor of the Historical faculty of the Moscow State University. In her study she analyses the rural settlements between the beginnings of the 17th – the 2nd half of the 18th centuries. The general aim of the whole study was to reveal the factors responsible for the distribution of population and households that could be seen at the thematic maps. For this purpose the two levels analysis of space quadrates was made based on the theory of fuzzy sets. The main factors describing the quadrates net were such as the dimensions of plotted and cattle lands, quality of soils, water resources and roads. The results were displayed at the map. The territories described by the 3rd class of the 1st level occurred to be the most populated ones. 41% of all small villages (sel’tso) of the district were situated on these lands. On the other hand the best harvest was gained on the more light soils (class 2 of both levels).

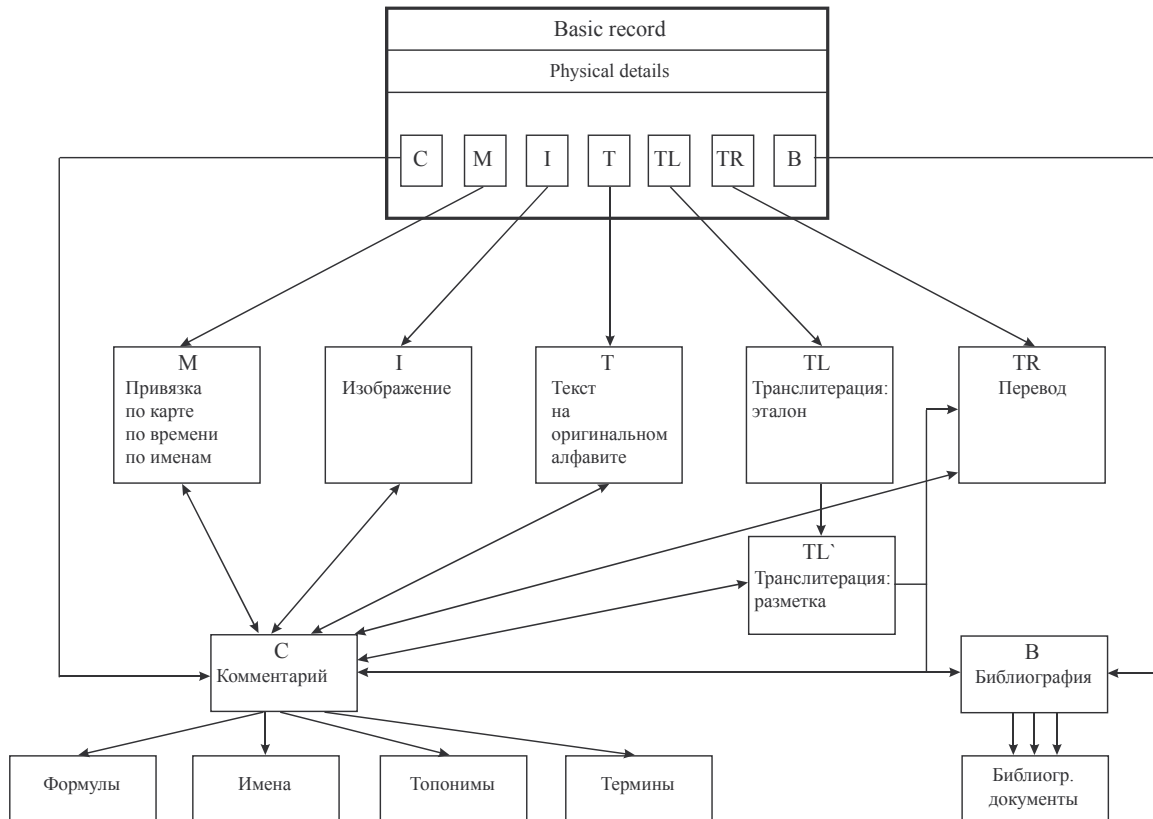


Among the other scholars who gained good results using GIS technology the research group of Tambov State University is to be firstly mentioned. They developed a project titled “The Model of the Historical Geo-Ecological Dynamics of Tambov Region in the 17th – 20th centuries. Within this project 11 digital maps were produced. Among them you can see, for instance, map showing the process of settling this region in the 17th cent. The possibilities of the GIS technologies to lay the maps of different times one upon the other are to be the most valuable ones. Thus the dynamics of co-existence of man and nature could be shown in the best manner. In particular with this aim three landscape digital maps of Tambov Region were developed on the base of Atlases of 1960, 1981 and 1999. On the base of these digital maps three zoo-geographical maps were also developed.

Concerning the activities that flow within the frames of the Orientalists’ Society of the RAS it is noteworthy to say that the interest in using the maps in computer historical studies is as great in the regions as in the center. Among these regions Far East, Buryatia, Altai, Tuva, Kalmykia, Central Russia are to be counted. The level of digitizing is not even in all the regions though.

Here we come to the problem of creating the model of the multilayer DB that can be considered as the starting point of any scholarly research. It gives the general impression of the Oriental historical artefact. This model is represented in the Scheme 1 of the DB for the Oriental historical artefacts. In this scheme the layers of the Multilayer

Hypertext Model look like some working blocks being the parts of the unit “Basic Record”



This scheme consists of eight working blocks named by the Latin letters: M – place and time; I – image; T – text in native script; TL – transliteration – sample text; TL’ – transliteration – marked text, TR – translation of the text; B – bibliography; C – commentary.

From one point of view these blocks are equivalent to the layers of the Multilayer Hypertext Model and from the other point they could be tied to the definite buttons on the monitor or on the keyboard. These buttons being pressed (or clicked) could open new working windows.

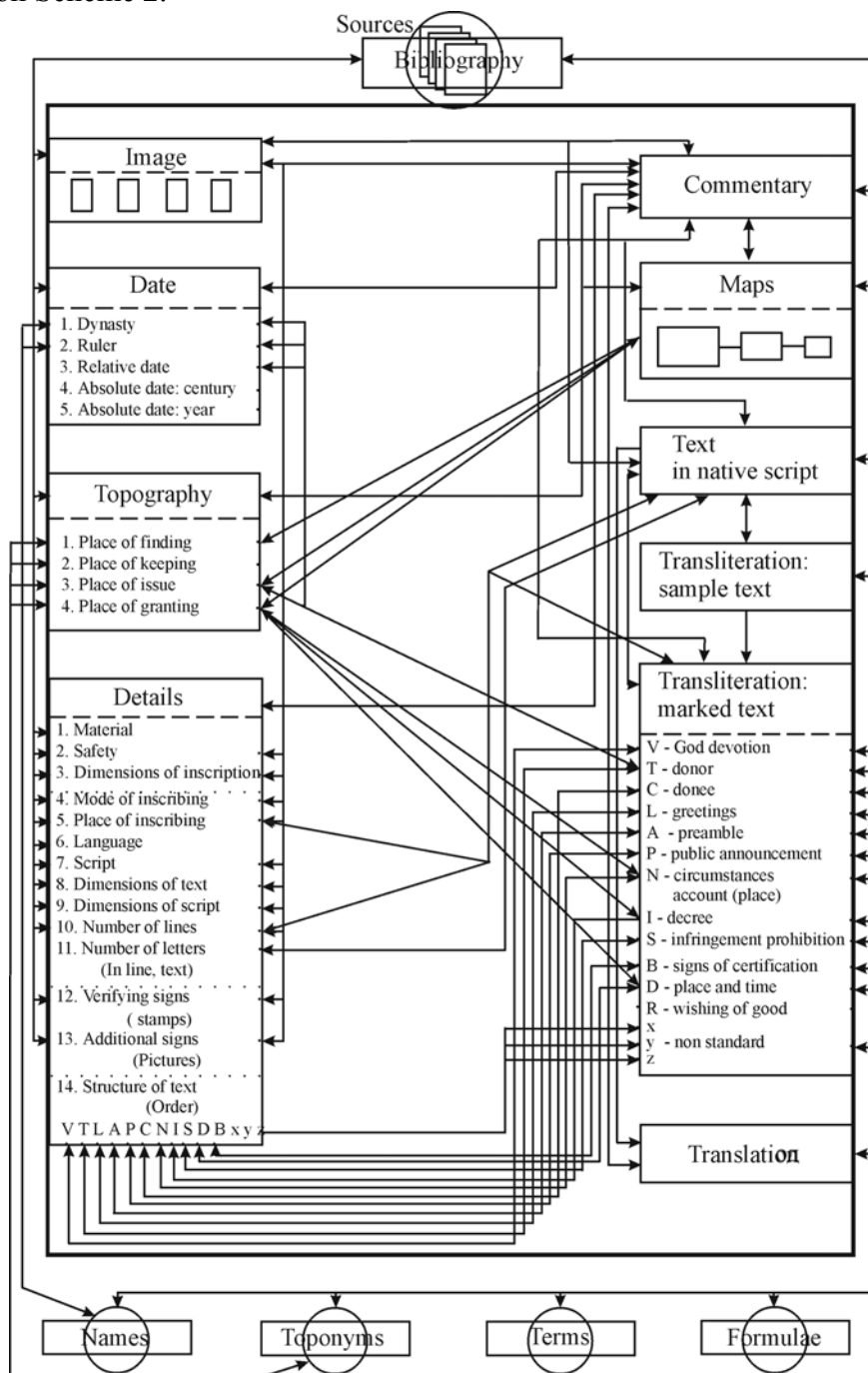
There are three blocks in this scheme that represent original text. They are T – text in native script; TL – transliteration – sample text; TL’ – transliteration – marked text. It can be explained by the peculiarities of the Indian early mediaeval palaeography. It varies a lot depending on the place and time. As a matter of fact the script changed every half of a century. The script of each inscription is unique to some extent. It is impossible to work out some unified font that could be used for recording if not all but the vast majority of inscriptions in the original. That’s why the transliteration is the most convenient mode for representing these texts. It is clear from the said that information contained in the blocks T – text in native script and TL – transliteration – sample text is practically equivalent. On the other side the block TL’ – transliteration – marked text happens to be of special value for the scholar because it permits to cut the text of the source to some parts and to work with these parts either analysing the structure of the single document or comparing similar parts of many sources, etc.

The arrows connecting different blocks in the Scheme 1 show the character of links between the blocks. So one can see that the information contained in the block I – image is the base for the block T – text in native script, in its turn the information contained in the block T is the base for the block TL – transliteration – sample text and the info of this block is the base for the block TL’ – transliteration – marked text and so on.

Blocks C – commentary and B – bibliography take the special, secondary, place in this scheme because both of them do not contain original information.

Generally this scheme approach more closely to the building up the logical structure of the epigraphic set of the Oriental historical artefacts. There are both links between blocks (levels) and their directions. Nevertheless it must be both added and corrected – both inside blocks and between them.

More detailed logical scheme of creating the DB for Oriental historical artefacts is shown on Scheme 2.



Generally it follows the structure of described scheme. Working blocks of the scheme are now framed with bold line. It is shown thus that they form a unit describing some oriental historical source that has inner structure and links. On the other side they are separated from the thesauruses “Names”, “Terms”, “Formulae”, etc.

This detailed logical scheme now consists of ten working blocks. They are “Image”, “Dates”, “Topography”, “Details”, “Commentary”, “Maps”, “Text in native script”, “Transliteration: sample text”, “Transliteration: marked text”, “Translation”. From the point of their content the blocks may belong both to one type: be lexical, digital or graphical, and to the mixed type: be lexical-digital, lexical-graphical, etc.

Let’s consider some of them.

- I. Working block “Image” consists of graphical records. There are links with working blocks “Details” and “Text in native script”;
- II. Working block “Dates” consists of lexical and lexical-digital records. It may look like a table in which docs are recorded in lines divided into five parts: dynasty, ruler, relative date, absolute date: century, absolute date: year. There are links with working blocks “Commentary”, “Topography” and “Transliteration: marked text”;
- III. Working block “Topography” consists of lexical records. It may also look like a table in which docs are recorded in lines divided into four parts: place of finding, place of keeping, place of issue and place of granting. There are links with working blocks “Commentary”, “Maps” and with some elements of the working block “Transliteration: marked text”;
- IV. Working block “Details” consists of different records: lexical, digital and lexical-digital. It may also look like a table in which docs are recorded in lines divided into fourteen parts: material (lexical), safeness (digital), dimensions of the object (digital), mode of inscribing (lexical), place of inscribing (digital), language (lexical), script (lexical), dimensions of the text itself (digital), dimensions of the script (digital), number of lines (digital), number of signs – in line, text (digital), verifying signs – signature, stamp (lexical or digital), additional signs pictures (lexical or digital), structure of text – sequence order (lexical). The elements consisting this working block may be conditionally divided into four groups: the first three of them describe objective properties of the Oriental historical object, the next eight elements describe the properties of text, hence they are subjective ones, the next two are objective ones and the last one is again subjective. Different elements are linked with a lot of working blocks.
- V. Working block “Commentary” consists of a lot of non-standard lexical records. As a matter of fact it is linked with all other working blocks.
- VI. Working block “Maps” consists of graphic records. There are links with working block “Topography”;
- VII. Working block “Text in native script” consists of a lexical record of the text of Oriental historical object. This record is both sample and critical. In some digital editions the other working block “Transliteration: sample text” may be used instead of this block. It is linked with working blocks “Transliteration: sample text”, “Commentary”, “Transliteration: marked text” and “Translation”.

- VIII. Working block “Transliteration: sample text” also consists of a lexical record of the text of Oriental historical object. It fully follows the properties of the working block “Text in native script”.
- IX. Working block “Transliteration: marked text”, which includes some set of components, such as 1. inVocatio - God devotion, 2. inTitulatio - donor, 3. insCriptio - donee, 4. saLutatio - greetings, 5. Arenga - preamble, 6. Promulgatio - public announcement, 7. Narratio - account of circumstances, 8. dIspositio - decree, 9. Sanctio - prohibition of infringement, 10. corroBoratio - signs of certification, 11. Datum - place and time, 12. appRecatio - conclusion = wishing of good. It is the so-called Latin circuit of segmentation of the conditional text form.
- X. Working block “Translation”.

The theoretical sides of the matter are now developed by the National Service for Developing the Formats System – RUSMARC – working in the frames of the project “Russian Communicative Format”.