GEOCOGNITIVE CARDS AND TECHNOLOGIES – A NEW PHASE IN CARTOGRAPHY

Evgenii S. Antonov
Siberian State University of Geosystems and Technologies, 10, Plakhotnogo St., Novosibirsk, 630108, Russia, Ph. D. Student, Department of Cartography and Geoinformatics, e-mail: nvvku2007@mail.ru

The article considers the possibilities of applying the geocognitive approach in cartography and the associated changes in the role and functions of maps in new conditions. The role of the map is considered as a figurative and symbolic geoinformation model of reality for rapid and adequate perception of information. Modern society imposes new requirements on all technologies and technological products, including maps. To make the right decision, the user must get only reliable information from a huge array of data. In the modern world, there is a rapid development of new technologies, including information. Such technologies allow to find new forms of representation of geospatial information. We need new products and technologies that are targeted at different users, adapted to the cognitive features of human perception of information, and will contribute to rapid and correct decision-making.

It is concluded that new maps are needed, the content of which is supplemented with geospatial knowledge, and also contributes to the formation of new knowledge. The knowledge-based map makes it possible not only to analyze, structure and present any relevant information in a convenient form, but also to transform, improve and put into practice the resulting intellectual product. These cards are geocognitive cards.

Key words: spatial knowledge maps, knowledge, imaginative thinking, geovisualization, geodata, GIS, cartography, cognitive geo-image, geospatial knowledge.

REFERENCES

1. Komissarova, T. S., & Morozova, O. N. (2015). Visualization of geographical space by the cartographic method. *Vestnik SPbGU. Ser. 7. Geologiya. Geografiya [Bulletin of St. Petersburg State University. Ser. 7. Geology. Geography]*, 3, 144–152 [in Russian].

2. Ibáñez, R. (2014). *Mechta ob ideal'noy karte. Mir matematiki: T. 26, Kartografiya i matematiki [The dream of a perfect map. World of mathematics: T. 26, Cartography and mathematics]*. Moscow: De Agostini Publ., 176 p. [in Russian].

3. Castells, M. (2010). *The Information Age: Economy, Society and Culture: Vol. I, The Rise of the Network Society*. Wiley-Blackwell.

4. Berlyant A. M. (1978). *Kartograficheskiy metod issledovaniy [Cartographic research method]*. Moscow [in Russian].

5. Lisitsky, D. V., & Dyshlyuk, S. S. (2015). Multipurpose cartographic resource – a new direction in cartography. *Geodeziya i kartografiya [Geodesy and Cartography]*, 11, 16–19 [in Russian].

6. Lisitsky, D. V. (2016). Cartography in the era of informatization: new challenges and opportunities. *Geografiya i prirodnye resursy [Geography and Natural Resources]*, 4, 22–29 [in Russian].

7. Shishaev, M. G., & Lomov, P. A. (2013). Intelligent dynamic mapping technology for integrated territorial security management. In *Sbornik tezisov dokladov Vserossiyskoy konferentsii s mezhdunarodnym uchastiem: Primenenie kosmicheskikh tekhnologiy dlya razvitiya arkticheskikh regionov [Collection of Abstracts of the All-Russian Conference with International Participation: Space Technology for the Development of the Arctic Regions]* (pp. 274–276). Arkhangelsk: CPI NArFU Publ. [in Russian].

8. Ginis L. A. (2004). Construction of multilayer cognitive maps. *Izvestiya TRTU [News of TRTU]*, 4, 212–218 [in Russian].

9. Basovsky, L. E. (1999). *Prognozirovanie i planirovanie v usloviyakh rynka [Forecasting and planning in market conditions]*. Moscow: INFRA-M Publ., 260 p. [in Russian].

10. Mikheev, V. A., Shevyrev, A. E., Shalamonova, N. G., & Fedotova, M. A. (2014). Visual thinking in analytics: problems, possible approaches and ways of mastering. In *Sbornik materialov Pervoy vserossiyskoy konferentsii: Analitika razvitiya i bezopasnosti strany: realii i perspektivy. – M. : Agentstvo pechati [Proceedings of the First All-Russian Conference: Analytics of the Development and Security of the Country: Realities and Prospects]*. Moscow: Press Agency "Stolitsa".

11. Vicentiy, A. V. (2016). Application of adaptive geovisualization in geosocial media. *Internet zhurnal "Naukovedenie" [Online Journal "Naukovedenie"]*, *8*(4), 1–15 [in Russian].

12. Karpik, A. P., Lisitsky, D. V., Baykov, K. S., Osipov, A. G., & Savinykh, V. N. (2017). Geospatial Discourse of Advanced and Breakthrough Thinking. *Vestnik SGUGiT [Vestnik SSUGT]*, *22*(4), 53–68 [in Russian].

13. Roth, R. E., Donohue, R. G., Sack, C. M., Wallace, T. R., & Buckingham, T. M. (2014). Process for Keeping Pace with Evolving Web Mapping Technologies. *A Cartographic Perspectives*, 78. Doi: 10.14714.CP78.1273.

14. Medyńska-Gulij, B. (2014). Cartographic sign as a core of multimedia map prepared by noncartographers in free map service. *Geodeziya i kartografiya [Geodesy and Cartography]*, 63(1), 55–64. Doi: 10.2478/geocart-2014-0004.

15. Crampton, J. W., & Krygier, J. (2006). An introduction to critical cartography. *ACME: Intern. EJourn.Critical Geographies*, 4(1), 11–33.

16. Ledermann, F., & Gartner, G. (2015). Mapmap.js: A Data-Driven Web Mapping API for Thematic Cartography. *27th International Cartographic Conference ICC2015 (August 23–28)*. Rio de Janeiro / Brazil Maps Connecting the World.

17. D. R. Fraser Taylor, & Tracey Lauriault (Eds.). (2006). *Cybercartography: Vol. 5, Theory and Practice* (1st ed). Elsevier Science Publ., 594 p.

18. Maiellaro, N., & Varasano, A. (2017). One-Page Multimedia Interactive Map. *ISPRS Int. J. GeoInf.*, *6*(2), P. 34.

19. Malinvernia, E. S., & Tassettiaa, A. N. (2013). GIS-based smart cartography using 3D modeling. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, ISPRS 8th 3D GeoInfo Conference & WG II/2 Workshop (27–29 November 2013): Vol. XL-2/W2*. Istanbul, Turkey.

20. Ryzhakov, V. V., Ryzhakov, M. V., & Ryzhakov, K. V. (2002). Reflection of the behavior of complex objects based on representations of fuzzy sets. *Oboronnyy kompleks – nauchno-tekhnicheskomu progressu Rossii [Defense Complex – to the Scientific and Technological Progress of Russia]*, 2, P. 28 [in Russian].

21. Ryzhakov, V. V., Ryzhakov, M. V., & Ryzhakov K. V. (2004). Reflection of the accuracy of identification of fuzzy sets in representations of situations. *Izmeritel'naya tekhnika [Measuring Technique]*, 10, 20–23 [in Russian].

22. Bershadskaya, E. G., & Filippova, N. A. (2012). *Bazy dannykh: teoriya, razrabotka i ispol'zovanie [Databases: theory, development and use]*. Penza: Ministry of Education and Science of Russia, Penza State Academy of Technology, 107 p. [in Russian].

Received 26.02.2020