DESIGN OF WORKABLE GEOINFORMATION SYSTEM

Pasichnyk Oleksandr
Ph.D., Associate Professor
Khmelnytskyi National University
Khmelnytskyi, Ukraine

Introductions. The representation of geographic objects in digital form and their organization into complex models determines the possibilities of obtaining answers to a wide range of requests, from the simplest to the complex analysis of numerous coverages, obtaining opportunities for conceptualizing, registering and analyzing our environment and presenting the results of this analysis, using and obtaining profit from computerized geography.

Aim. These opportunities are implemented within the framework of specialized software - geoinformation systems, the correct construction and implementation of which determines the potential horizon of the end user's capabilities.

The design of a geoinformation system, like any information system, involves the selection of tools, the definition of objects and their relationships, the choice of a field of research, data evaluation, etc.

Materials and methods. Qualitative design involves the correct organization of data, the construction and/or use of correct data models, rational limitations of software functionality with a correct cost estimate.

An important aspect of the effective use of even a qualitatively designed system is its adequate complexity and comprehensibility for the personnel of the entire potential of the system.

You also need to consider the loss of system relevance due to aging of software and hardware, data or work methods that reduce the flexibility of the system in changing conditions. Finally, there are possible cases of failure due to a change in the organizational structure when implementing a new technology in a manual environment.

Most geoinformation systems are created to order for other organizations

that use them in their work. The system must be functional and economically attractive in a financially sensitive commercial environment. It should combine knowledge from data models and algorithms through theories of business-oriented systems and operations research to the ability to organize the work of their assembly into a single unit subordinate to the ultimate goal of the system

The first GIS began to appear in the 1960s. These systems were created both for the purpose of experimentation in universities and as operational systems. They turned out to be unsuccessful due to the lack of analytical tools, erroneous results, low speed, etc.

The main problem of the first GIS was their poor design as software systems. But today there is an increasing number of functional spatial-analytical tools, which may not be purely geographic information systems, but perform their tasks effectively and are attractive from an economic point of view.

Results and discussion. Most of the problems associated with GIS today are not technical, because the current level of GIS capabilities far exceeds the requirements of the user community, primarily in commercial applications. The underlying problem is a mismatch between software capabilities and user needs from data and analysis to learning and recognition.

Conclusions. The task of GIS design should be considered as a general software development option that can be useful in creating an effective GIS.

LITERATURE

1. Геоинформатика: Учеб. для студ. вузов / Е.Г. Капралов, А.В. Кошкарев, В.С. Тикунов и др.; под ред. В.С. Тикунова. – М.: Издательский дом «Академия», 2005. – 480 с.

2. Pasichnyk O. Basics of programming for geoinformation systems // Topical issues of modern science, society and education. Proceedings of the 8th International scientific and practical conference. SPC “Sci-conf.com.ua”. Kharkiv, Ukraine. 2022. Pp. 226-229.

3. Технології комп’ютерного проектування : конспект лекцій для здобувачів вищої освіти (ОР «бакалавр») спеціальності 122 «Комп’ютерні науки» / О.А. Пасічник, Р.В. Сорокатий, , Т.К. Скрипник, Е.А. Манзюк. – Хмельницький: ХНУ, 2021. – 136 с.

4. Основи об‘єктно-орієнтованого програмування: навч. посіб. для студ. ВНЗ / Сорокатий Р.В., Пасічник О.А., Скрипник Т.К. – Хмельницький: ХНУ, 2019. – 175 с.

5. ДеМерс Майкл Н. Географические информационные системы. Основы.: Пер. с англ. – М.: Дата+, 1999. – 489 с.

6. Скворцов А.В. Геоинформатика: Учебное пособие. – Томск: Изд-во Том. ун-та, 2006. – 336 с.

7. Вестра Э. Разработка геоприложений на языке Python / пер. с англ. А. В. Логунова. - М: ДМК Пресс, 2017. - 446 с.: ил.

8. Поморцева Е. Е. Программирование геоинформационных задач: учеб. пособие / Е. Е. Поморцева; Харьков. нац. ун-т гор. хоз-ва им. А. Н. Бекетова. – Харьков: ХНУГХ им. А. Н. Бекетова, 2017. – 121 с.

9. Бескид П.П., Куракина Н.И., Орлова Н.В. Геоинформационные системы и технологии. - СПб.: изд. РГГМ У, 2010. - 173 с.

10. Блиновская Я.Ю., Задоя Д.С. Введение в геоинформационные системы. – М.: Форум, 2016. – 112 с.

11. Бугаевский Л.М., Цветков В.Я. Геоинформационные системы: Учебное пособие. – М.: 2000. – 222 с.

12. Лайкин В.И., Упоров Г.А. Геоинформатика: учебное пособие / Лайкин В.И., Упоров Г.А. – Комсомольск-на-Амуре: Изд-во АмГПГУ, 2010. – 162 с.

13. Лурье И.К., Самсонов Т.Е. ОСНОВЫ ГЕОИНФОРМАТИКИ // Информатика с основами геоинформатики. Часть 2: Основы геоинформатики. Учебное пособие. – М.: Географический факультет МГУ, 2016. – 200 с.

14. Pasichnyk O. Design of geographic information systems // Modern research in world science. Proceedings of the 2nd International scientific and practical

conference. SPC “Sci-conf.com.ua”. Lviv, Ukraine. 2022. Pp. 363-368.

15. Pasichnyk O. Spatial data models // Innovations and prospects of world science. Proceedings of the 10th International scientific and practical conference. Perfect Publishing. Vancouver, Canada. 2022. Pp.347-351.

16. Semantic alignment of ontologies meaningful categories with the generalization of descriptive structures / E. A. Manziuk, O. V. Barmak, Iu. V. Krak, O. A. Pasichnyk, P. M. Radiuk, O. V. Mazurets // Problems in programming. - 2022. Vol. 3, No. 4. - P. 355-363. DOI: https://doi.org/10.15407/pp2022.03-04.355.