

SOME ISSUES ON MEASURING THE ECONOMIC VALUE OF GEOINFORMATION

Serghei CUCOREAN, Tatiana CUCOREAN

State Agrarian University of Moldova, Department of Cadaster and Geodesy,
Chişinău, 42 Mirceşti St, Republic of Moldova, phone: +37379508879,
e-mail: cucoreanserghai@gmail.com, e-mail: pralea_tatiana@mail.ru

Scientific coordinator: Senior Lecturer, PhD **Mihail TURCULEȚ**,
Technical University of Moldova, Chişinău 41 Dacia Blvd., Republic of Moldova,
phone:+37379508879, E-mail: turcpetr@yahoo.com

Abstract

The paper discusses the information collection and management process, taking into consideration its economic aspects. It analyzes the classification procedures for the information applied in elaborating the information systems and aims at examining ways to change the economic value. It is recommended that the design process should also include the economic value into its factors.

Key words: information system, economic value, geoinformation, village, utility.

INTRODUCTION

New inventions take us by surprise every year. Their utility is acknowledged by the users, following some time of implementation and verification. Time length depends on many factors, among which the economic development and readiness of the enterprises that want to make good use of the invention resources. Information technologies, GIS techniques and land measurement technology can be counted among the inventions.

The information influence on the present development has resulted in giving contemporary society the name of information society [1]. The name is argued by the role played by information as a production means. Quantitative and qualitative aspects provide information with value and result in comparisons related to the organization or decision-making performances.

The last few decades have been prominent by acknowledging GIS as a very useful tool in making various decisions [4]; thus, it has drawn the attention of many users, particularly those working in the planning and analysis of the current status. GIS application

is also stimulated by the need to monitor the processes taking place in the environment, as well as the elaboration of the economic and social development strategy of villages, towns and cities for better land use and other opportunities.

MATERIAL AND METHOD

GIS has an economic potential that can be used in the Republic of Moldova. Local public authorities and inhabitants of the respective areas are among the most advantaged beneficiaries from the GIS influence. Unfortunately, no GIS has been implemented in any village, town or city until now. This can be certainly explained by several factors against GIS implementation, among which the myth according to which 'GIS is very expensive and useless' [5]. This assumption is based on the situation created by the cadastral information provided by the private companies approved by the local public authorities and currently owned by the Land Relations and Cadaster Agency. The information is administered by the Regional Cadastral Offices that gain income from

statement issuing and information updating as the real assets owners or local public authorities expenses pay the expenses.

Although it is known that the information can contribute to productivity increase, it is necessary to adopt modern technical solutions. Beneficiaries can select the working solutions according to several criteria.

The analysis of the GIS implementation conditions and method in several local city, town and village halls shows that the Local Public Administration is responsible for its approval. For this purpose, it needs to know the benefits, a detailed presentation of the expenses for each phase, including the exploitation expenses, and accountancy type.

Table 1 Indicator system for investment effect on GIS elaboration

Effect type	Effect indicators
Economic effect	Added value to economic processes. Lower time for elaboration and decision-making. Higher space use. Identification of fields for long-term investments.
Structural technical and scientific effect	High share of new information technology. High process automation coefficient and Internet network use. High organizational level and land use. Low use valorization in adding value to the economic processes. Administration of issuing urbanism certificates and building authorizations.
Social effect	Increasing income for works. High degree of meeting vital necessities. High professionalism of employers. Better work and rest conditions.
Ecological effect	Waste use management. Ecological improvement of conditions. Decreased pollution.
Psychological effect	Increased trust in transparency and limited corruption. Possibility to know the content of argumentation substantiating decision-making.

It is necessary to bring arguments for the whole period. The Caracui village is one of the most picturesque in Central Moldova. The particular beauty of the village results from its geographic location, more exactly the surrounding hills which provide a special landscape. Probably in the future the village could become an attractive tourist place, with a huge economic potential which needs to be studied and turned into good account.

The existing materials can be used to complete the information layers so that the Caracui Village Hall should reduce the costs for GIS elaboration. For this purpose, we will present a simplified cost estimate, providing a comparative analysis of GIS elaboration cost in the above-mentioned village.

The described phases resulted in the cost estimate (model) which includes the following works and their expenses:

RESULTS AND DISCUSSION

At present, in the Republic of Moldova, beneficiaries make the selection based on the production cost equivalent to an investment. Investment in Geoinformation Technologies is specific owing to its final result leading to the recovery of expenses and investment duration. Such investment can also lead to increasing or decreasing value in time; however, given that the nature of information can be updated and completed, it is supposed to have an unlimited duration of operation.

Table 1 presents some particularities resulting from the effect of investing in Geoinformation Technologies.

Analysing the calculations in table 2 we can state that GIS elaboration by using the materials already existing in the village halls is more economically convenient, and their updating will significantly increase the importance of an informational system. The benefits will lead to the recovery of the investment for GIS elaboration in only a few years.

At present there are many cartographic materials that can be used for GIS elaboration [2], [3], [6]. These materials have been elaborated while performing the cadastral works (figure 1) and can serve as information layer. It is worth mentioning that the Republic of Moldova permanently finances water supply and sewage projects and the city, town and village halls receive the projects only in printed form.

Table 2 Cost estimate (model) for GIS application in the Caracui village

Number	Work type	Work cost including new materials (Moldovan lei)	Work cost including existing materials (Moldovan lei)	Estimated amount of work cost including new materials (Euro)	Estimated amount of work cost including existing materials (Euro)
1	Feasibility study	42100	21000	2635.05	1314.4
2	Procurement of Map Info software	160000	160000	10014.46	10014.46
	Database structure design	72000	24000	4506.51	1502.17
3	Scanning existing topographic materials	300	300	18.78	18.78
	Aerial levelling by laser scanning	75000	-	4694.28	-
4	Vectorization works for relief and objects not included in cadastral plans	4500	-	281.66	-
5	Pedological map vectorization	7000	-	438.13	-
6	Cadastral works	8795	-	550.48	-
	Database completion	1 software	-	-	-
7	Pedological mapping	3500	-	219.07	-
8	Analysis, verification, correction and creation of thematic layers	12000	-	751.08	-
9	Hydrological prospects	8000	-	500.72	-
Total		393195	205300	24610.22	12849.8

This is unfavourable for the inclusion of the civil network in an information system and the eventual investigations of the villages in the Republic of Moldova increase their price. The companies that provide design services should be compelled by law to offer graphic information related to the civil networks planned to be built in cities, towns and villages. At the same time, the authorities should protect the so-called 'technological secret'. The integration of the materials into an information system could exempt the local public authorities from certain expenses related to topogeodetic levelling. The contribution of the companies to the development of the application would permit

their use of the already existing information in the system.

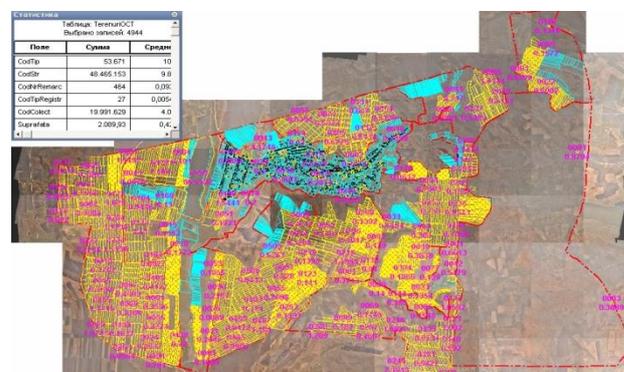


Figure 1 Cadastral plan overlapping the orthophoto image of the village

CONCLUSIONS

The necessity to develop a space data infrastructure has been identified worldwide, in order to substantiate policies, programs and actions, resulting in sustainable economic and social development and good leadership.

GIS implementation in the towns, cities and villages of the Republic of Moldova depends on not knowing the cost of the works and the method of recovering the expenses.

The proposal refers to the elaboration of an estimate describing the expenses required for each phase.

Beneficiaries and executors will identify the solutions in relation to quality and price.

In the initial phase, GIS will be implemented in some villages by using the existing materials and the lowest cost of the works.

REFERENCES

- [1] Lorena Batagan. Revista Informatica Economică, nr. 2(26)/2003 Catedra de Informatică Economică, A.S.E. București.
- [2] Peter A. Burrough and Rachael A. McDonnel „Principles of Geographical Information Systems”.
- [3] Michael Zeiler „Modeling our World”
- [4] Peter F. Dale „Data for Land Administration the foundation on which all infrastructure is built”.
- [5] C. M. Mitran, V. Nicoara, Eficienta utilizării tehnologiei GIS in elaborarea strategiilor de dezvoltare regionala. Studiu de caz: Regiunea de dezvoltare Centru, Geographia tehnică, nr . 1 , 2006.
- [6] Petrescu, F. - Sisteme informatice geografice în urbanism și amenajarea teritoriului, ed. Matrix Rom, 2007. Mureșan F., (2010).