

GIS – new possibilities for enhancing the usability of statistics

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Context

For a long time, Statistics Lithuania has only used geographic information systems (GIS) for drawing statistical maps for statistical publications. In 2013, we presented to the public the Official Statistics Portal (OSP) (<http://osp.stat.gov.lt>) – a multifunctional state statistics information system, enabling a substantial improvement in the accessibility of official statistics and opening up new possibilities for the analysis and presentation of statistical indicators. One of the innovations of the portal – integration with GIS, enabling the mapping of selected statistical indicators. In 2017, the OSP, including the GIS component, was substantially updated. The GIS component was supplemented with additional functionality, enabling users to perform more complex analyses.

GIS applications on the Lithuanian Official Statistics Portal

The GIS component on the OSP is comprised of three applications:

- **Analysis tool in the Database of Indicators**, enabling the presentation of statistical indicators on maps by administrative territory of Lithuania;);

This application allows users to create their own maps from the statistical indicators selected in the Database of Indicators. One statistical indicator goes to the background, which is presented in a selected palette according to the selected number of intervals, method and administrative area of Lithuania. The rest of the indicators selected are presented on the map as charts. The users can select a bubble, a bar or a pie chart.

New in 2017: formation of maps from derivative indicators and expanded options for forming indicator values.

- **Interactive atlas**, enabling temporal and spatial data analysis by administrative territory (county and municipality).

This application is used for the temporal and spatial analysis of statistical indicators and their comparison. The application is directly linked to the Database of Indicators, which makes it possible for the most recent data to appear in the interactive atlas immediately after they have been published in the database. The application has two domains: “General statistics”, containing statistical indicators updated on an annual basis, and “Censuses”, containing only statistical indicators from population and housing and agricultural censuses. In the interactive atlas, users can view statistics by administrative unit of Lithuania – county and municipality. The application also has a possibility to display up to four maps in one window and compare them. For each map, users can select different statistical indicators or the same statistical indicator in different periods.

New in 2017: possibility to share/reuse maps in social networks, websites, etc.

- **Detailed statistics application**, containing population and housing and agricultural census data and indicators of economic entities at a more detailed territorial level than administrative units (by grid, bubble charts, and by freely drawn boundaries).

In the detailed statistics application, statistical information is presented based on a grid approach. The selection of this method was motivated by Eurostat, with the main objective of presenting the results of the censuses conducted by the EU Member States based on a general grid approach.

The detailed statistics application is used to present information from (population and housing and agricultural) censuses. The two domains are displayed in different ways: statistical indicators from the population and housing census are presented based on a grid approach, those from the agricultural census – based on a bubble chart approach. Depending on the scale, the statistical indicators from the population and housing census are presented in 10x10 km, 5x5 km, 2.5x2.5 km, 1x1 km, 0.5x0.5 km, 0.25x0.25 km, and 0.1x0.1 km grids. Grids from 10 to 1 km cover the entire territory of Lithuania, 0.5 and 0.25 km grids – all country's cities and towns, 0.1 km grids – only city/town municipalities.

At the moment, the population and housing census domain of the detailed statistics application contains more than 30 statistical indicators. Another function of the application allows users to outline a specific area and obtain the value of the indicator of interest within that area.

The detailed statistics application has an integrated Lithuanian Spatial Information Portal's basemap and orthophoto map and an area search function. Those services allow having in the GIS application an up-to-date map of the territory of Lithuania.

New in 2017: formation of a buffer zone around an object; delineation of a territory as a regular or irregular geometric figure by entering data or coordinates; uploading of additional data; downloading of statistical GIS data; the most recent annual statistics at the most detailed level (indicators of economic entities); possibility to share/reuse maps in social networks, websites, etc.

Common development of GIS: new GIS licences. Currently used technologies – Esri ArcGIS v. 10.2.1.

Growing need for detailed spatial statistics

Every year we carry out user surveys. And every year users express a growing need for more detailed spatial statistics. In essence, GIS applications were created and further developed namely taking into account this growing need. However, at the moment, considerable investment in GIS technologies and the scale of use of GIS services significantly diverge: the number of users of GIS services is growing too slow, while the user profile remains the same – a serious user, a professional, an expert.

The problem is clear: although the need for detailed statistics presented on maps is growing, the services are used only by a specific, select audience of professionals. So where's the rub?

On the one hand, visual presentation of statistics should be easier to comprehend for users than sophisticated tables in the Database of Indicators. On the other hand, users have obviously not yet made friends with this tool; we have noticed that the abundance of options strikes them with awe – rather than arouse a desire to try and use it.

In our opinion, the problem is twofold:

- 1) limited relevance of GIS statistics: statisticians are reluctant to produce detailed data for publication via GIS tools;
- 2) users do not want to or cannot use/adapt statistical maps for their needs, including commonplace real-life situations.

In our presentation, we will not be discussing the former issue; meanwhile, the latter issue, in our opinion, is not only a worrisome problem but also a great opportunity to expand the statistical user base.

So what can we do to help users overcome cartophobia?

Through the improvement of the GIS component, we expect to offer our users new services and appeal to new, non-typical user groups. That is, to bring GIS services closer to “random” users – random people who every once in a while find themselves in the situations where statistics could come in handy.

In this context, we plan on attracting such potential users by telling them new statistical “stories”, created using GIS, as well as by presenting the multiple ways official statistics can be used.

In our brief presentation, we will attempt to demonstrate the expanded functionality of GIS in Lithuanian statistics and share two statistical “stories” – hoping, in turn, to hear the ideas and experience of using GIS for broadening the user base of official statistics from our European colleagues.

Story 1. Looking for a job and a nanny

Problem: A young mother wants to return to work after two years of maternity leave. Unfortunately, during the crisis, her workplace went bankrupt. So she has no job. Nor does she have a place to leave her child during daytime... In the district where her family lives, there is just one kindergarten, and they will get a place in there in a year – and that is in the best case scenario! So, she needs not only a job but also a nanny.

Story 2. Jolly company goes kayaking

An IT company is organising a team building event. They decide to go on a multi-day river kayaking trip. They need a route and information: where to make stops, where to camp or look for accommodation, what to see on the way.

Conclusions

It is obvious that information is usually searched for and analyses are made in GIS applications by “serious” users. But how to attract the “unserious” ones? The two stories show that it is worth considering new methods of approaching non-typical users. In the nearest future, we plan on encouraging intermediaries – promoters, tourism centres, advertising and even dating agencies, accommodation enterprises – and the general population to use and reuse GIS services.