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Topic (ii): Dissemination and client relations

PRACTICAL EXPERIENCE TOWARDS DESIGNING WEBSITES FOR PRESENTATION OF STATISTICAL DATA

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I. INTRODUCTION

1. Internet is becoming increasingly important as a dissemination channel for statistical data and the role of statistical websites will increase accordingly in the future. The statistical websites would present a wide variety of collected and analysed data. The internet and the new developing tools offer new possibilities for a statistical organization to create more sophisticated websites with large data sets.

2. This paper presents some experiences with how websites can be developed for presentation of statistical data about all territorial units in the Slovak Republic. These experiences are discussed on statistical websites: MOŠ/MIS (Urban and Municipal Statistical Project and Information System of the Slovak Republic), Urban Audit, INFOREG (INFOrmation system for support of REGional development in the Slovak Republic). Each of these projects has its own requirements, goals and users. These elements are discussed in detail below.

3. The most important and critical success factors for the implementation of a statistical website are:

Users. They have to be the centre of attention. It is important to investigate who the users are, what they really need, how they use the data, what their competence levels are. Results of this research enables improvement of the website and, in the long term, reduces the costs for the

server burden on the statistical side and time consumption on the user side. Dividing users into groups enables specific demanding functions for the appropriate users only.

Maintenance. The development and maintenance of the website should not just be the task of IT experts and special dissemination staff. Support from the management of organizations that present data as well as from the users that are seeking the data (at least from some larger institutions), is of great importance for finding the best design to satisfy both parties.

Metadata. This document distinguishes between two types of metadata: namely those assisting search and navigation and those assisting in interpretation of data. A flexible and consistent metadata support should ensure that the published statistical data is transparent and comprehensible to the users. Metadata enables easy search of data using dimensions of indicators, territorial units and periods. The website architecture must provide comprehensible navigation across the whole website. It must be easy to find the desired data inside the website and always to know the current position inside the territorial unit structure and indicator structure.

Post-processing. The user must be able to download data into his technical environment. The data should be provided in well-accepted standard formats.

4. Users and metadata are analysed below. Maintenance is an organizational responsibility and post-processing is the technical part of the design.

II. USERS

5. The ways in which sites are designed can either improve or impede the benefit of users to use information and data on the websites. The websites have to satisfy their needs and to attract them to repeatedly visit websites. A user is a visitor who wants to apply the content of the web site for some purpose. Certain groups of potential users need to be attracted to a given website by advertisements. For some groups of professional users, websites are important in their work so it is not important to undertake any special marketing activities. It is possible to restrict access to certain users by providing user-name and passwords, at least to some sections of the website.

6. Different kinds of users normally have very different needs of a website. The following is an attempt to create a typology of users according to three different viewpoints:

(a) according to the frequency of visits:
- occasional users,
- regular users who need information for their work or research projects, for example journalists or students and

(b) according to users' special interests:
- researchers and scientific institutes who are looking for information for their research work and analyses,
- businesses or investors who need some information for their decision making about new investments, and
- governmental and regional bodies who, for their work, have to use information to decide to redistribute financial resources and to govern state and local administration.

c) according to professional background and interest:
- broad audience (lay readers) and
- professional users (specialists).

7. In general, knowledge about the users group is important for sites with large amounts of data and metadata. Reduction of time consumption and server burden can be done by registration and accessing web pages by user name and password. Only the users that know what kind of data they want and how to obtain them could access these pages. These users do not burden the server with a large number of accidental queries. This is organized according to types of users: users with limited skills in statistics and informatics, skilled users with limited inclination to read and analyse data and metadata and expert users skilled in searching, making queries, retrieving and interpreting statistical information.

III. METADATA

8. The web design also depends on the concept of metadata. There are different kinds of metadata. The most important are: metadata assisting search and navigation and assisting in interpretation of data (descriptive metadata). Other metadata are administrative metadata, processing metadata and metadata about users.

9. Descriptive metadata describes the collected and presented data on a website. They provide a logical, consistent and integrated environment for data. Data are situated in a cube of three dimensions (axis):
- territorial unit (according NUTS classification),
- indicator (name, type of data, measurement unit, comparability over time, source of the data, contact points for additional information …) and
- period (in which time periods is possible to collect indicator's values).

Each dimension uses its own classification. The structure of three-dimensional cube is shown in Figure 1.

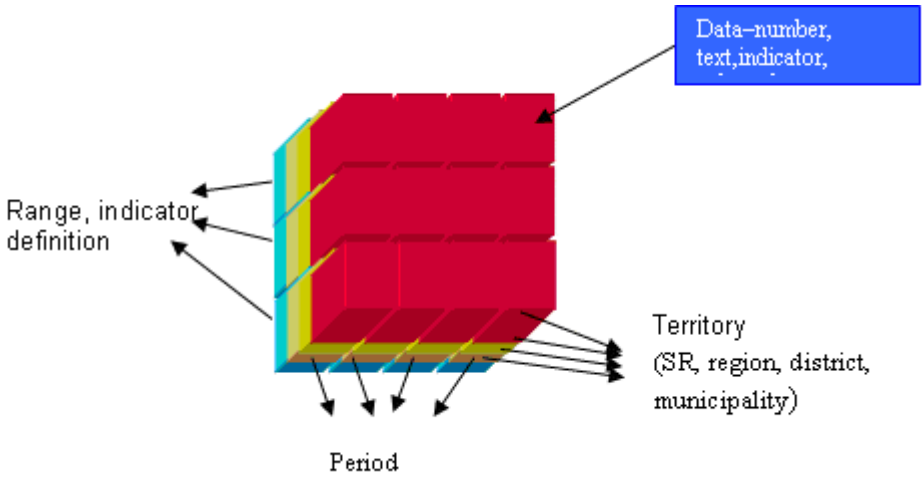

Figure 1: Structure of three-dimensional cube

10. These dimensions are the basis for navigation on websites to reach appropriate data. In all of above-mentioned projects, descriptive metadata are used to present collected data and improve navigation on website. A good navigation structure can attract occasional users or users with

limited skills in statistics to use the websites and professional users to facilitate their work. In MOŠ/MIS and INFOREG the whole NUTS structure is used whereas in Urban Audit part of the NUTS structure is used for selected cities in European Urban Audit project. The period dimension is important for INFOREG only. In INFOREG websites indicators are presented for more periods, whereas MOŠ/MIS presents the data for actual year only and Urban Audit for 2001 year.

11. Metadata for search and navigation are broadly interconnected with descriptive data in cases when websites contain large amounts of statistical data. Descriptive metadata are used to navigate across three-dimensional axis of indicator, territorial unit and period. Another search and navigation method is well known in large numbers of web design guides: site map, search forms, etc for example.

12. Creation and maintenance metadata about users depends on the purpose of the website. Creating different types of users, their rights and responsibilities to work on website is most important for INFOREG. Different types of registered users have different interfaces and possibilities to create and preview tables. Some users can create they own reports and download them into different formats.

13. Administrative metadata control what kind of registered users' access web pages and what data are most requested by users and in which time intervals they want this data. It is also useful to monitor the server burden during creation of reports. This metadata can be used in the personalization of websites for particular users or to improve website for better access to most interested data for users.

IV. WEBSITES

A. MOŠ/MIS

14. The purpose of this presentation is to enhance the ability of the domestic and foreign communities to be informed about the basic indicators and territorial structure of the Slovak's municipalities. The goals are the following: to simplify and facilitate access to basic data about municipalities; to enable presentation of the whole structure of monitored indicators and periods of monitoring and the contact data in case of users want to order data.

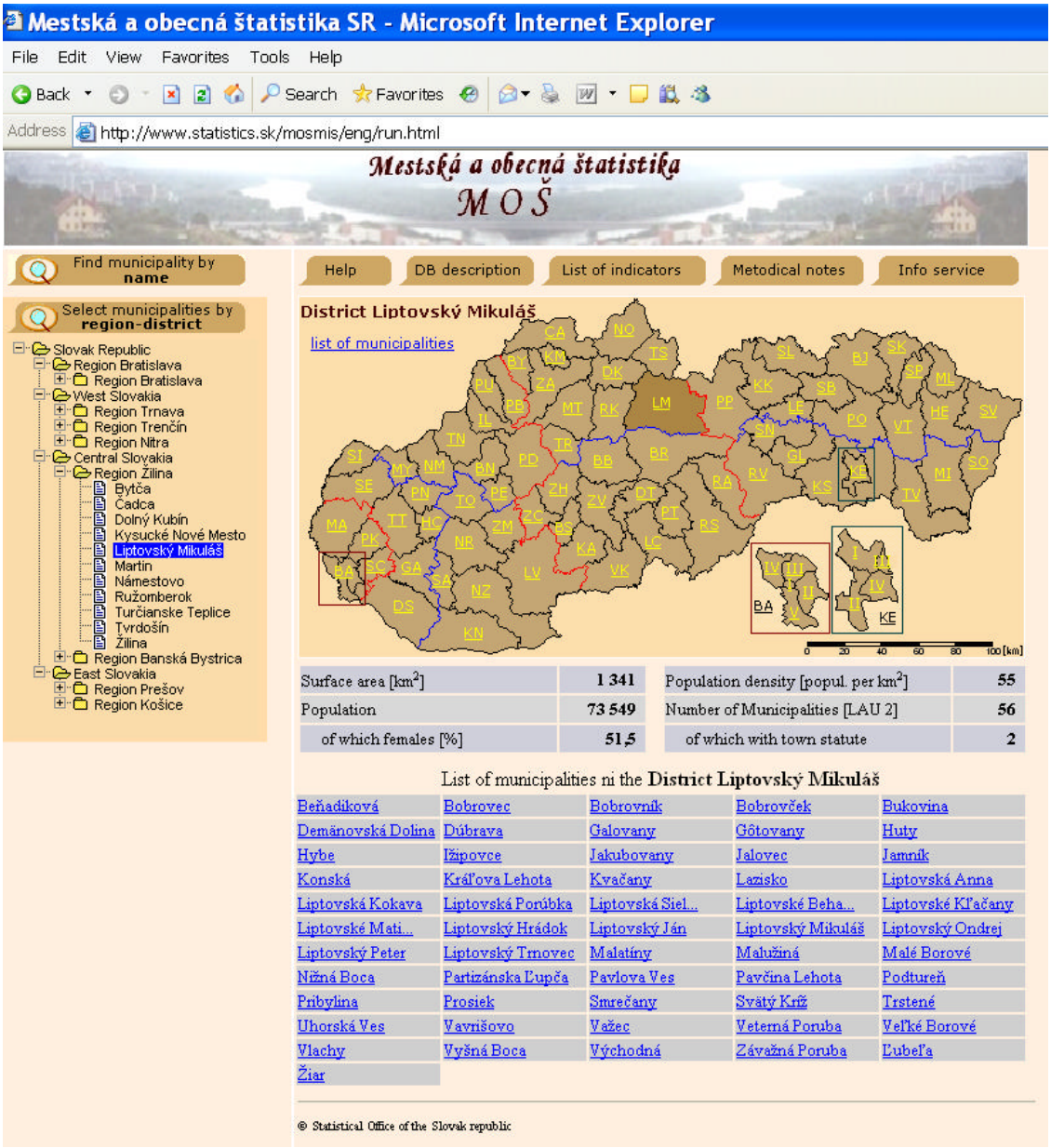

Figure 2: Navigation to the municipality

15. The MOŠ/MIS website presents selected indicators for all municipalities and basic information about all higher NUTS levels. The presented data are free of charge. Other indicators for the actual year or all indicators for previous years are paid. The price is a logarithmic function of the number of needed indicators, territorial units and years. In the MOŠ/MIS system the dominant objects are urban and municipalities. The navigation is adjusted to this case. There are three cases of reaching municipalities. The first is fast, reaching the district (NUTS 4) by map and choosing the municipality from a list of municipalities belonging to the selected district. The second is navigation across the hierarchical tree from NUTS 1 to NUTS 4 structure. These two navigation cases enable a preview of the position on the map and basic information for a selected district, region, group of regions and country (Figure 2). The web pages for a level higher than the municipality level may already contain some statistical key

figures on the condition that they really are important and are always maintained up-to-date. Third, the user can reach the desired municipality directly through the search engine.

16. The search engine is dynamic; it means that when the user selects the municipality, the NUTS tree automatically changes and all district levels are compressed except the district where is the selected municipality. This district is decompressed and basic indicators for the selected municipality divided into domains are presented in Figure 3.

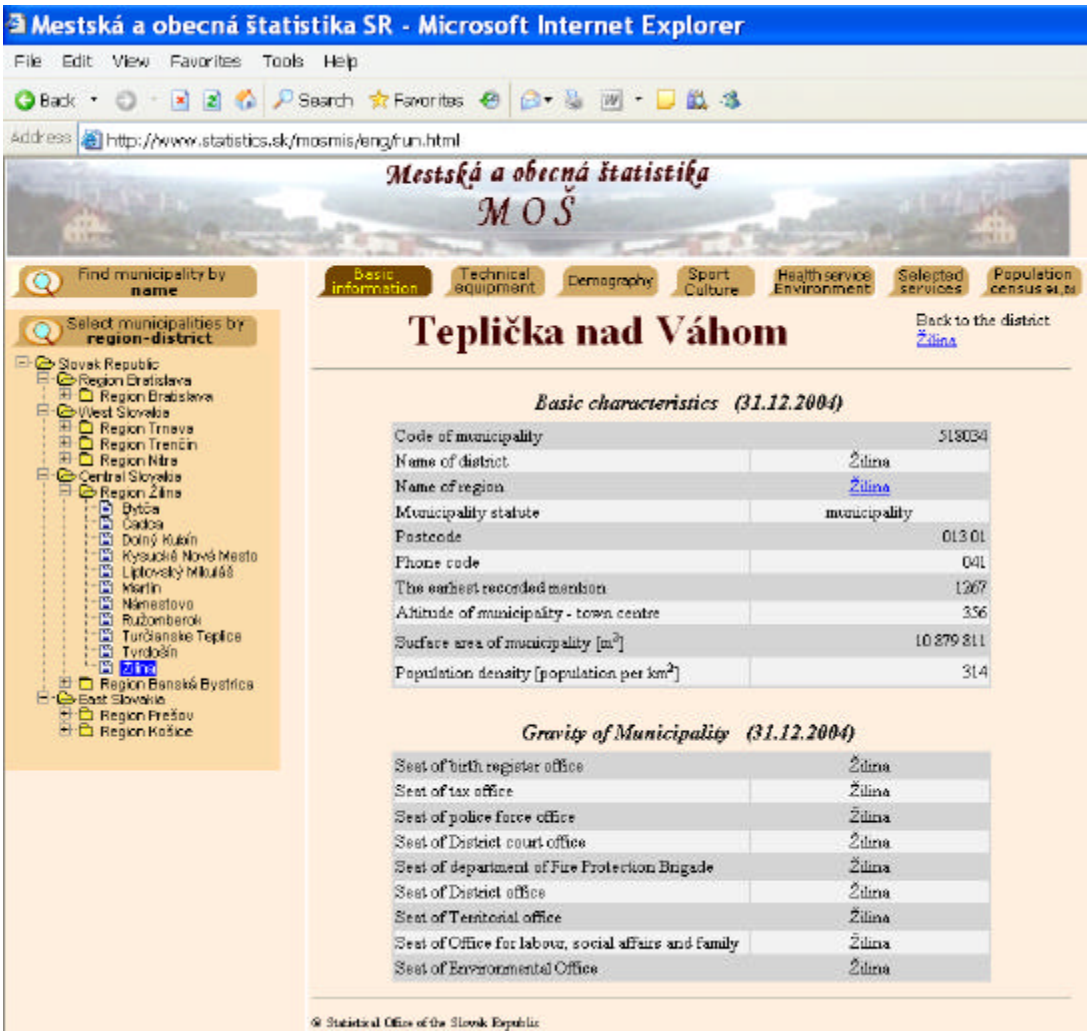

Figure 3: Indicators of municipality

17. The MOŠ/MIS website is a compact entity; all pages are in one window. Navigation through a website should be comprehensible and efficient from the user's point of view. It is most irritating to be somewhere on the website without knowing how to continue in a meaningful way. A hyperlink to the home page as well as hyperlinks some steps back to the beginning of the section are not often sufficient. In the MOŠ/MIS website descriptive metadata are also used as a navigation tool. Users can very easily obtain all domains of indicators by one click. The user can also very easily obtain district, region and group of region for the analysed

municipality. It is very useful that the user can by one click on the tree of territorial units attain totally different districts with municipalities. The territorial unit tree is always ready to be used and also shows the user's position into whole NUTS structure of the Slovak Republic.

B. Urban Audit

18. This section presents the results of the European Urban Audit project for selected towns in the Slovak Republic. The goal is to present all data about monitored towns in this project to interested users.

19. The Urban Audit website presents all indicators about four selected towns (Bratislava, Košice, Banská Bystica and Nitra). All indicators for selected towns are presented on the website (C - city), one level above or districts (L – large) and parts of town (S - sub cities). The navigation structure is the same as in the MOŠ/MIS website. This structure is shown in Figure 4 for Bratislava city. The territorial unit tree has the same structure as the one for the previous website but for selected districts, cities and sub cities only. This project collected data for all levels except for Slovakia. The user can obtain data for all supported territories by selecting the appropriate one from the tree. Here are significantly more indicators (331) in comparison with MOŠ/MIS where 140 indicators are presented. Indicators are divided into domains and sub-domains that are in a drop-down menu. After clicking on the sub-domain, the user can see all indicators and their values.

20. The website is similar to the previous one. When users become familiar with one of these websites they will be able to easily use the other one. Both websites mentioned above present data only to visitors without the possibilities to download from the websites.

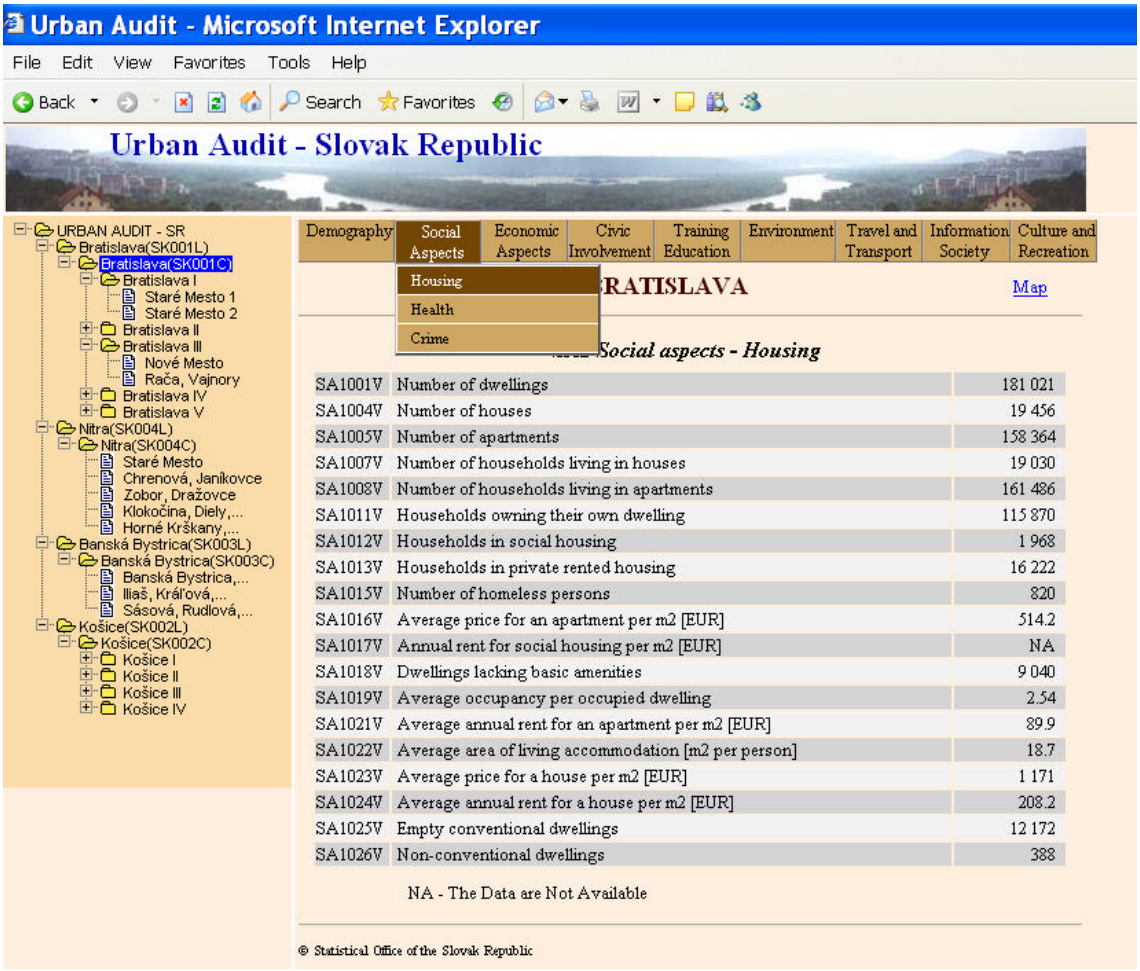

Figure 4: Urban Audit data

C. INFOREG

21. The purpose of this website is to present basic indicators about all territorial levels in the Slovak Republic and to provide background for professional users. The goals are the following: to present selected reports to the interested visitors, to enable presentation and download of whole structure of monitored indicators to professional users as well as creation reports according their needs and download these reports in well- accepted standard formats.

22. INFOREG, in comparison with the previous ones, contains the largest number of descriptive metadata and data and access is free of charge. Users are recognized and divided into four categories. For each category the mode of usage is designed by the USE CASE and sequential diagrams. Dividing users into groups enables specific demanding functions for the appropriate users only.

23. Non-registered users have access to a preview of all descriptive metadata and to the basic predefined reports. The header and the columns (indicators) of the basic reports have a

predefined design and users can change only rows or NUTS level for what they want data. Some indicators can also be presented on thematic maps.

24. Professional users have access to all descriptive metadata with the possibility to download them in Word or Excel format. In general, it is very important to decide what kind of information or descriptive metadata is needed to describe the socio-economic reality and choose the appropriate collection methods. It is important that those who are concerned by the statistical information can obtain sufficient data related to the current status and can analyse data and make their conclusions on this status.

25. The professional user can dynamically create reports on the web page by selecting one or more indicators, one or more periods and different territorial units and levels (whole NUTS level or one part of his and/or some of his lower levels). Time series for some indicators as well as wider description of territory for one period can be very easily created. If the user's proposal meets the user's needs, it needs only a click on the button: "Prepare report" to show figures to the user. Figure 5 shows the report preparation page. The results can be downloaded directly into different formats. The amount of data that can be downloaded in that way is limited per user's session by reason of performance.

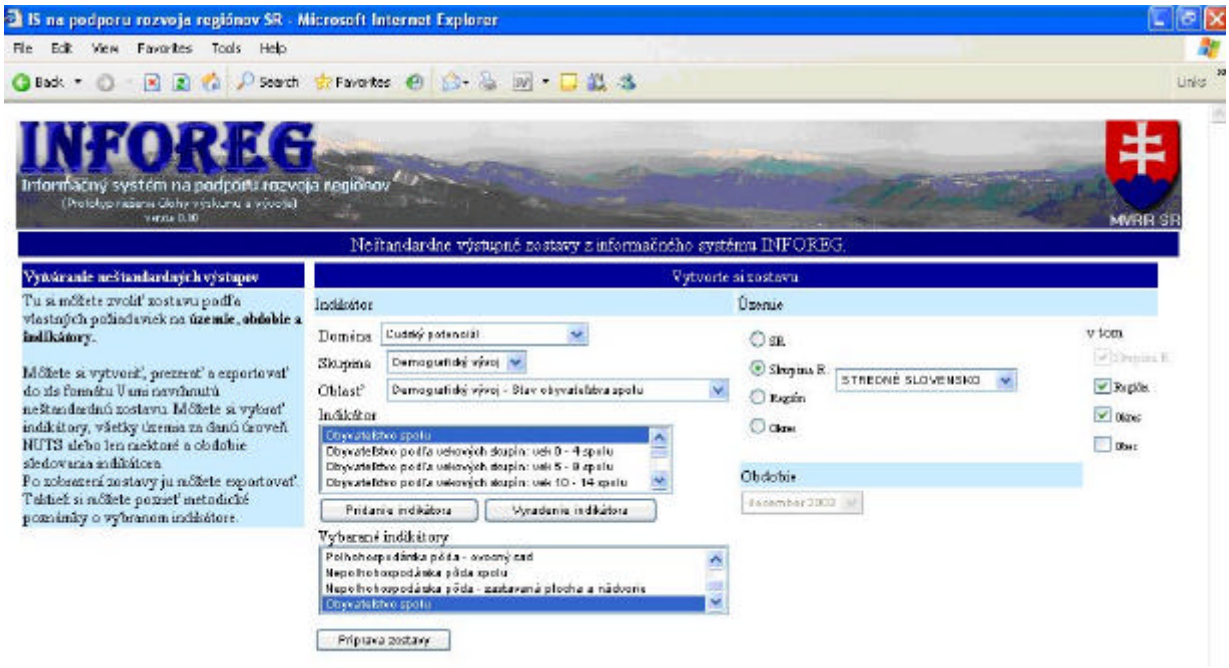

Figure 5: Preparation of report

26. This webpage is designed for creating reports according to user's needs. The NUTS tree is changed with the option buttons and list boxes for each of level for the sake of selecting desired part of level and radio buttons for selecting appropriate sublevels on reports.

D. Other websites

27. One of the next projects is the web presentation of censuses from 1921 year to 2001 year. Each of the censuses will be presented separately in a structure similar to the first two projects:

navigation by hierarchical territorial units and census indicators. The time series across entire periods for some indicators will be presented too.

V. CONCLUSION

28. The MOŠ/MIS website and the Urban Audit website are finished and they are on the website of theStatistical Office of the Slovak Republic. The INFOREG website is in a prototype form, was tested and will be implemented in the Ministry of Construction and Regional Development of the Slovak Republic. These tree projects have specific as well as common points. The common points are analysed to obtain a united navigation as is possible.

29. The presentation of basic sets of statistical data results in a better-informed domestic and foreign community. The access to the wide area of data is useful for students, and journalists that analyse or present data. The access to the whole area of data is useful for statistical experts.

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