

Work Session on Geographical Information Systems
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NATIONAL REPORT: CZECH REPUBLIC

Submitted by the Czech Statistical Office ¹

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I. DESCRIPTION OF GIS PROJECT

1. The major goal of the GIS application at the Czech Statistical Office (CSO-CZ) is to analyse selected demographic data, and to represent links between selected socio-economic phenomena (e.g. population, transport intensity, the environment). Furthermore, GIS links the regional statistics databases and the set of GIS geographical data. The GIS is used to prepare and present data in the 2001 Population and Housing Census. Last, but not least, GIS services the subject-matter Divisions of the CSO-CZ, as well as its Regional Divisions to present regionally oriented data coming from branch and cross-section statistics.

II. DATA SOURCES

2. The sets of regional, demographic and social statistics represent the main data sources, but data from other branches are also used (agriculture, the environment, construction, external trade, etc.). Linkage with the CSO-CZ regional database is being developed. The regional database represents the basic data source for GIS.

3. Up until now, GIS was used particularly to present the results of the 1994 local election, 1996 election to the Chamber of Deputies and 1996 election to the Senate - the data source was the election results processed by the CSO-CZ. The source of digitalized data to build a geographical database is predominantly constituted by the Czech Authority for Land Surveying and Registration.

III. OUTPUTS FROM GIS AT THE CSO-CZ

4. The first GIS applications aimed at presenting the results of local and parliamentary (Chamber of Deputies, Senate) elections. The output was further used for regional applications, e.g. election results by region.

5. A project entitled "Presenting Data in the Data Publisher System" based on data processing in Arc View 2.1 was completed in cooperation with Arc Data Comp. This Project was tested on the "1994 Election Results in GIS". A demonstration and a full version was produced representing election results on CD ROM. In addition, since 1996 GIS has been used and its output applied to publications of regional statistics, such as "Regional Portraits", "Czech Republic's Towns in the Past", "Customs Border Crossings of the Czech Republic", "Small Lexicon of Municipalities" and "Czech Republic's Districts".

6. As required by the CSO-CZ subject-matter Divisions, map outputs are supplied by GIS for the appropriate publications and reports.

IV. HARDWARE AND SOFTWARE USED

7. Hardware:

- Workstation DEC 3000 under operating system OSF1, 64 MB memory, 1 GB HD;
- 4 PCS, versions 486 and Pentium, working under operating system Novell 4/Windows 3.11.

Printers

- Plotter HP 650, roll format A0, 32 MB memory;
- Printer HP 300 XL, 16 MB memory, colour outputs formats A3, A4.

8. **Software:**

- 1 licence with support for products Arc Info/Unix (now version 7.4) to produce and edit geographical database, and Arc Press/Unix to print graphically sophisticated map compositions;
- 5 licences with support for products Arc View 2.1 to produce geographical projects operating in Windows 3.11 environment (PCS 486, 16 MB memory, and more);
- 1 licence with support for product Arc View 3.0 and Spatial Analysis for production and analysis operating in Windows NT (or Windows 95, PC Pentium) environment.

9. The above overview shows that our equipment is at the basic level and the CSO-CZ is able to produce high-quality cartographic output. The system support is sufficiently handled for both Arc Info/Unix and Arc View/Windows 3.11.

V. **PERSONNEL AND FINANCIAL EQUIPMENT**

10. Since the 2nd quarter of 1997, a group of 4 experts is working on GIS at the CSO-CZ. The group is expected to expand in the future. Many of the group's tasks are now being solved in cooperation with external companies (Arc Data), as well as by teamwork inside the CSO-CZ. While the budgeted financial means for HW correspond to the present needs, they are rather low for planned further development.

VI. **PLANS FOR FURTHER DEVELOPMENT**

11. In years to come, GIS should be developed in the following areas:

- a) the use of GIS in statistical practice within the framework of the Regional Statistics Division and in other subject-matter divisions;
- b) the preparation of independent projects of the GIS Laboratory.

12. The GIS project on demographic statistics is based on the fact that the interconnection of geographical and statistical databases is the most appropriate. The geographical outputs will include map compositions and tables, the reference years being 1991 to 1996. The overall project should include the following sections: distribution of population, population density, trends in numbers of population and age structure of population - all this expressed in about 16 map compositions, including results for municipalities and districts of the Czech Republic.

13. GIS technology will also be applied to a project on geographical presentation of selected environmental indicators as linked to relevant socio-economic phenomena, e.g. the chain of population, transport intensity, environment (pollution), illness and birth rates, abortions, etc.. Three or more combined phenomena will be tested in the given area.

14. Hardware and software development.

- a) Hardware: CSO-CZ plans to increase the performance of the DEC work station. The possibility is being considered to make the GIS server available to the whole CSO-CZ or to buy an additional server so that the CSO-CZ's subject-matter divisions will have access to established GIS applications. There will be a gradual shift to Pentium Pro computers (at least 16 MB) and associated operating system as requested by SW products of Arc View.
- b) Software: CSO-CZ plans to purchase new software for the group of Map Objects, which would mean that requested presentations could be made from already

implemented GIS projects, using simple tools. At least one Arc Info licence will have to be bought as well.

- c) Acquisition of GRID system software, permitting the plotting of geographical phenomena, including their time trends, using a constant set of arbitrarily large, permanently fixed squares.
- d) Increase in manpower of the GIS Laboratory in future.