REGISTER OF TERRITORIAL UNITS-ROTE AND EVIDENCE OF HOUSE NUMBERS-EHIŠ - TEH BASIS FOR SPATIAL DATA DETERMINATION AND PRESENTATION

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dipl.inž. geod.

AVTORSKI IZVLEČEK

Evidenci ROTE in EHIŠ, ki ju v sodelovanju vodita geodetska služba in Zavod SR Slovenije za statistiko, predstavljata podlago za izgradnjo registra prostorskih enot. Geokodirani podatki in decentralizacija računalniških obdelav v občinah bodo prispevali k višji stopnji obdelav in večji uporabnosti zajetih podatkov. Tudi v SFR Jugoslaviji se vzpostavljajo konceptualne zasnove geografskih informacijskih sistemov (GIS) oziroma projekta GIZIS, kjer predstavljajo geokodirane baze podatkov ROTE-ja in EHIŠ-a pionirski korak k realizaciji slovenskega oziroma jugoslovanskega projekta.

AUTHOR'S ABSTRACT

Merging and further development of the ROTE and EHIŠ into Register of Spatial Units will contribute - with geocodes and gradual decentralization of computer processing of these data in communes - to a higher level of data processing and to greater application of data collection. The ROTE and EHIŠ geocoded data are the first step towards creating GIS respectively GIZIS (Geographical and Land Registration Information System) in Slovenia and Yugoslavia.

1. INTRODUCTION

In the Socialist Republik of Slovenia, one of the six republics of the Socialist Federative Republic of Yugoslavia, the geodetic service e.g. the geodetic activity in its broader sense covers in the field of data collecting, processing, storing and presenting mostly on maps. It is also in charge of some records; trough locating data in space it joins various spatial analyses. In the past the main function of the geodetic service was the cadastral one; yet with new tasks it is gaining importance and it is - especially in Slovenia - joning the Social Information System, environment and physical planning, recording of changes and interventions in the environment; and also the field of social reproduction.

The Statistical Office of Socialist Republic of Slovenia performs activities connected with the functioning of the Social Information System, E.g. it performs tasks connected with statistical data collecting and analysing, with organizing and managing joint registers, statistical and other databases and tasks concerning statistical research implementation.

As a result of an extensive research work in the field of spatial information systems (Banovec et al. 1973, 1975, 1977) and data territorialization (Podobnikar 1974, Berlot et al. 1977) there are the beginnings of setting up the Register of Territorial Units - ROTE and Evidence of House Numbers - EHIŠ in the late 1970's and early 1980's (Svetik 1978). The main organization in charge was the Republican Surveying and Mapping Administration of Slovenia, which - in cooperation with the Statistical Office of Socialist Republic of Slovenia - methodologically and professionally directed in communal surveying and mapping administrations, which were the main task performers in communes. Thus set up the ROTE and EHIŠ have served as a basis for the preparation and realization of the census of population in 1981 and have nowadays a significant

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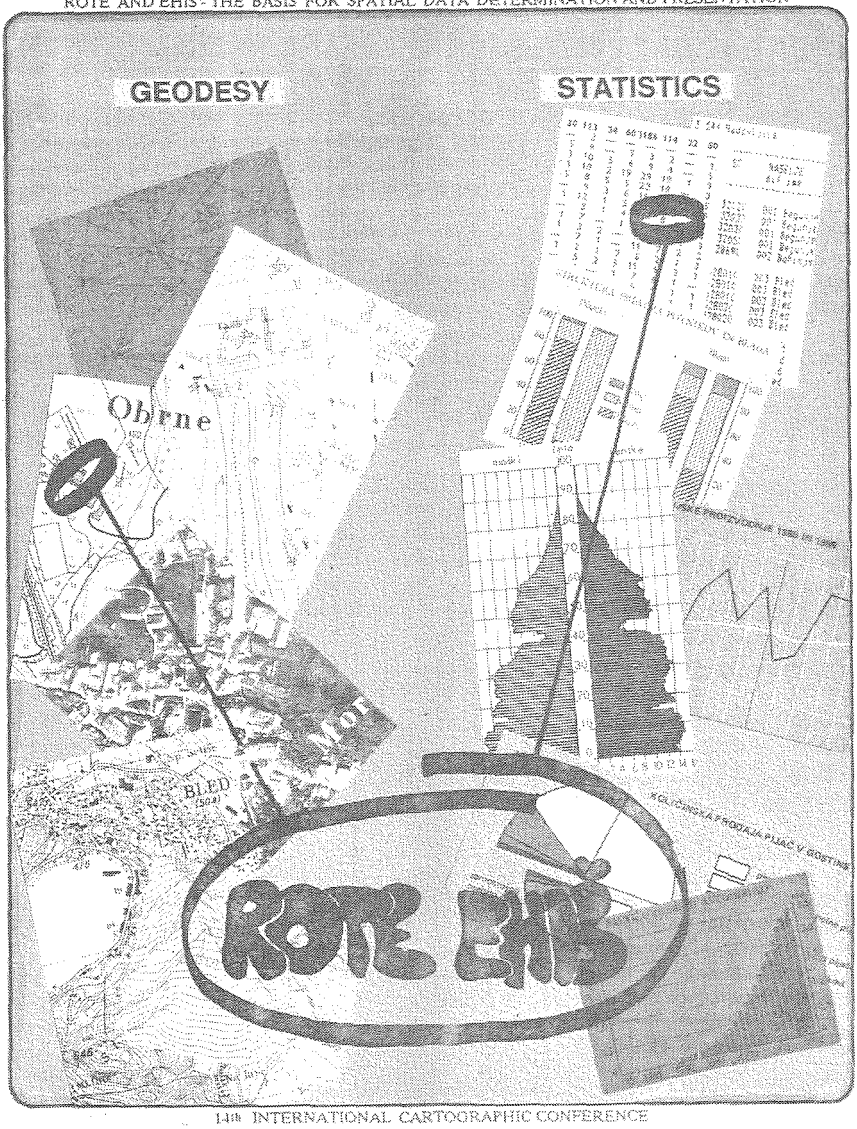

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role in the economic and social development.

2. BASIC CHARACTERISTICS OF THE ROTE AND EHIŠ

The ROTE (Lipej et al. 1988) manages and maintains boundaries of recorded territorial unit areas, surfaces, codes, names and their centroids. The ROTE consists of cartographic representations, computer-managed databases and documentation. The ROTE manages data concerned with the following basic territorial units: census circle, statistical circle, settlement, cadastral commune, local community and commune along with supplementary territorials units: polls, postal districts, local districts and other. Territorial units are determined by: territory, surface (except supplementary territorial units), code, name (except census and statistical circle) and co-ordinates of the centroid (except supplementary territorial units).

The EHIŠ (Lipej et al. 1988) manages and maintains data about streets and house numbers and their belonging to a particular territorial unit within settlements. The EHIŠ consists of cartographic representations, computer-managed databases and documentation. House numbers are determined for all residental and business premises in permanent or temporary use. In the digitalization phase all buildings with a house number get co-ordinates of centroids in the gravitation centre of an individual building. Codes and names are determined for streets.

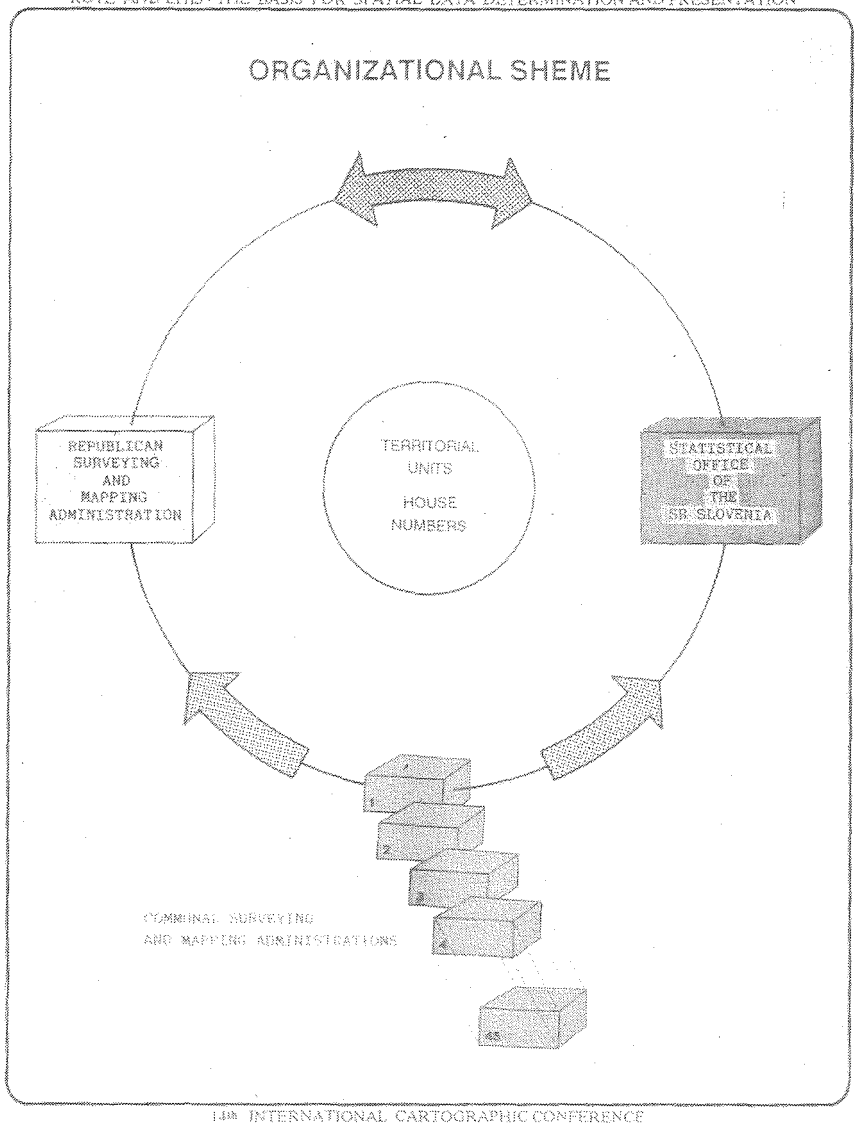
In Slovenia there were at the end of 1988 (Statistične informacije 1989): 13 193 census circles, 7 915 statistical circles, 5 946 settlements, 2 694 cadastral communes, 1 214 local communities; 275 local districts; 438 521 house numbers and 8 747 streets.

For communes, communal surveying and mapping administrations manage and maintain the following: basic (on 1:5 000, exceptionally on 1:10 000 scale) and collective (on 1:25 000 scale, common for the comunity) ROTE carthographic representations; cartographic representations of supplementary territorial units (on various scales); basic (on 1:5 000, exceptionaly on 1:10 000 scale) EHIŠ cartographic representations; digitized data of territorial units boundaries for commune level; centroids of buildings with a house number, and ROTE and EHIŠ documentation. Within Slovenia the Republican Surveying and Mapping Administration manages and maintains collective (on 1:25 000 scale) and generalized (on 1:50 000, 1:250 000, 1:400 000, 1:1 000 000 scale) ROTE cartographic representations, centroids of territorial units, digitized data of boundaries of territorial units for the republic level and the ROTE documentation. The computer-managed and maintained ROTE and EHIŠ records for the republic Slovenia and for communes is performed by the Statistical Office of Socialist Republic of Slovenia, whereas for communes alone also other qualified organizations may do it. In this way the ROTE e.g. EHIŠ records are computer-processed in nine slovene communes. In connection with both records there is also a house numbers determination and allocation performed by communal surveying and mapping administrations; and the naming of settlements and streets with streets markins, where they contribute professional support.

The ROTE and EHIŠ have managed to combine cooperation and harmonized work of two great systems: the geodetic and the statistical one. By means of spatial units geometry of administrative, functional and other character, the geodetic service is connected with data from professional administrative sphere; through data location it has made aggregation and distribution of wanted data possible. For the statistics the possibility of cartographic representation and visualization of spatially-oriented results of analytical processing meant a qualitative asset and a new dimension in statistical data transfer into social sphere.

3. LINKS AMONG JOINT REGISTERS IN COMMUNES AND IN THE REPUBLIC

Slovenia has set joint registers on the republic and commune levels. They represent basic multi-international databases of the Social Information System. On commune level the following records are managed and maintained: The Register of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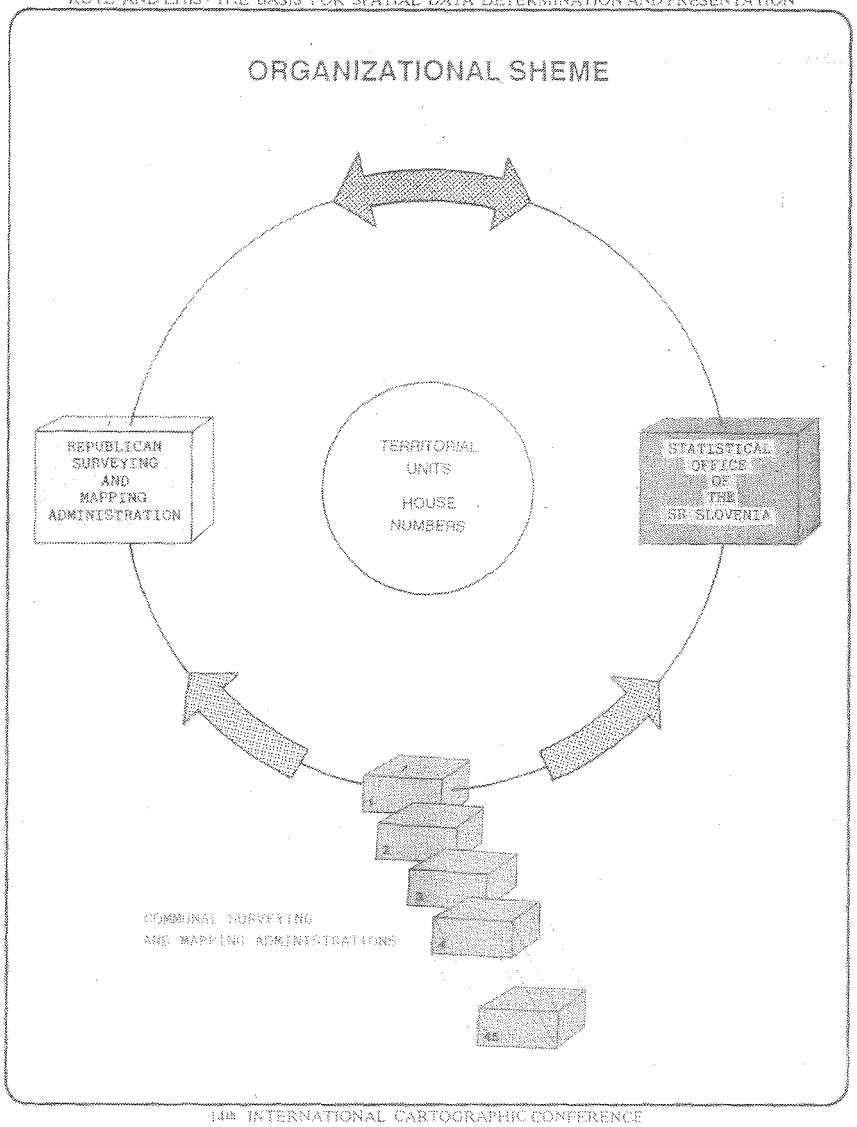
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Resident Population, ROTE, EHIŠ and Register of Private Craft Estabishements. For the Slovene territory the Statistical Office of Socialist Republic of Slovenia manages and maintains: The Central Register of Population, Central Register of Organizations and Communities (e.g. Register of Enterprises and their Establishements), RTE (ROTE), EHIŠ and Register of Private Craft Establishements for SR Slovenia.

Unique identifications form the basis for mutual linking of joint registers (Djordjević 1986): The Personal Registration Number, Registration Number, Standard Code of Territorial Unit and House Number. Unique identifications will enable economic and uniform defining of register units and a possibility of linking data from other records. The EHIŠ is connected with the Register of Residental Population, e.g. with the Central Register of Population; the connection between the EHIŠ and Register of Organizations and Communities is in its early phase of realization. The connection of the EHIŠ with the Registers of Private Craft Establishements and with the Register of Private Craft Establishements for SR Slovenia is planned.

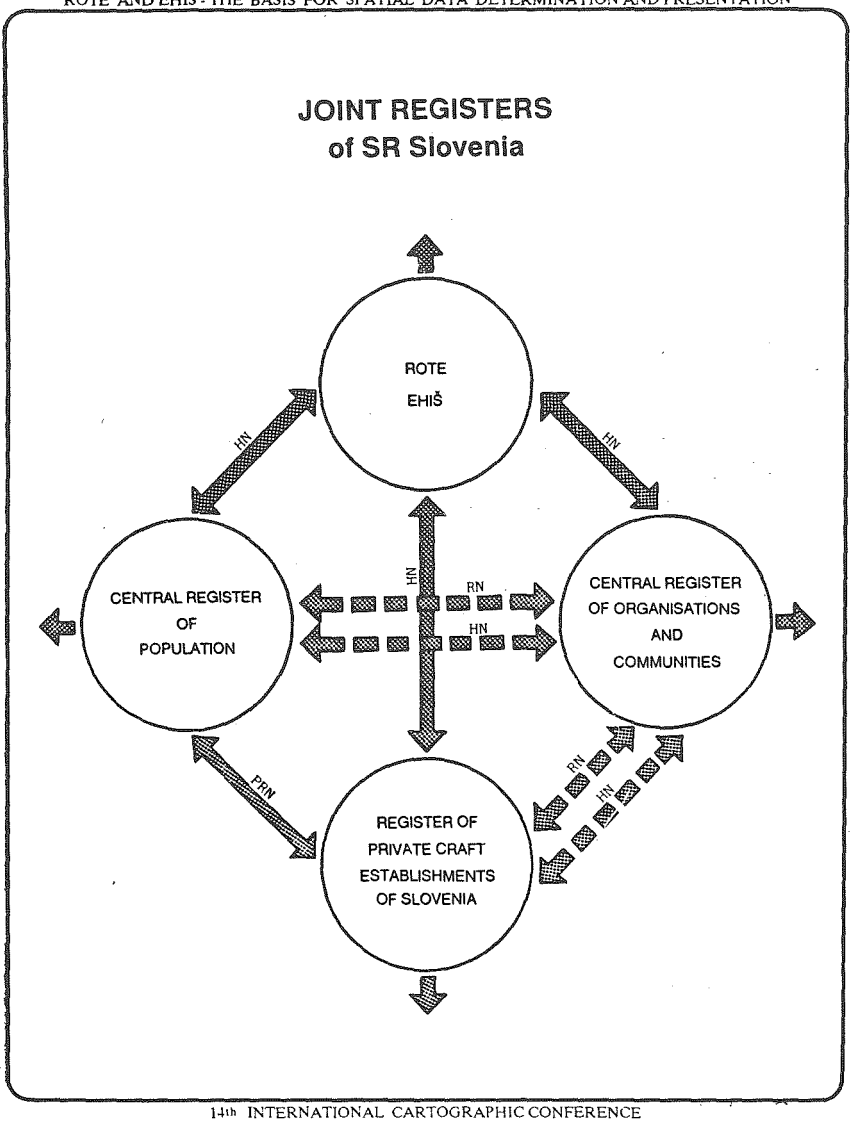
4. PRESENT AND FUTURE DEVELOPEMENT OF ROTE AND EHIŠ

In communes comunal (e.g. municipal) information systems are in the phase of being set up. They will connect data of communal administrative agencies and services such as: Communal Surveying and Mapping Administrations, Internal Affairs with the Register Office, Tax Office, National Defence Office, Personal Service, Committee for Environment and Physical Planning and Economy, and various Self-managing Communities of Interest (Health Service, Social Welfare...) and others. Communal surveying and mapping administrations join these systems with the EHIŠ data, e.g. with a house number, its belonging street and settlement, which is connected with the address of an inhabitant from the Register of Resident Population, Horizontal connections among data in several systems will be created to uniform immediate use of data from the original source of maintained data. In the same way also other data from the ROTE and EHIŠ could be taken over from the other systems; the backup data would show the correctness and mutual adjustment of the compared data.

Preparations for software to support managing and maintaining of ROTE and EHIŠ in communes on personal computers are made. This will result in decentralization of computer processing and it will enable their grater applications. Dataprocessing in communes has certain adventages as to centralized dataprocessing at the Statistical Office of Socialist Republic of Slovenia, such as shorter response time, dataprocessing on site apart from central system and greater adjustment and functionality of the system. The verical data flow will enable to connect data of the communal surveying and mapping administrations with those of the Republican Surveying and Mapping Administration and the Statistical Office of Socialst Republic of Slovenia. Thus the ROTE and EHIŠ data will be connected with data from other joint registers and with field agencies and organizations data for other activities (forestry, agriculture, traffic, railroads, water works...).

Since 1983, a project is going on to digitize territorial units boundaries and centroids of buildings with house numbers on the basis of ROTE and EHIŠ data on cartographic representations on 1:5 000 (exceptionaly 1:10 000 scale) (Lipej 1987). Co-ordinates of boundary points for territorial units contours and centroids of buildings with house numbers are set in the Gauss-Krueger co-ordinates system. Altogether there are already digitized 60% recorded territorial units boundaries from the ROTE and 60% centroids of buildings with a house number from EHIŠ in 35 communes, which cover 52% of all Slovene territory. There is a plan to digitize territorial units' boundaries and centroids with house numbers for all other communes till 1990. This will enable processing and presentation of the results of the 1991 census of population with thematic cartography. The co-ordinates of centroids all basic territorial units are also determinated.

Territorial units' boundaries contours, co-ordinates presented, their centroids and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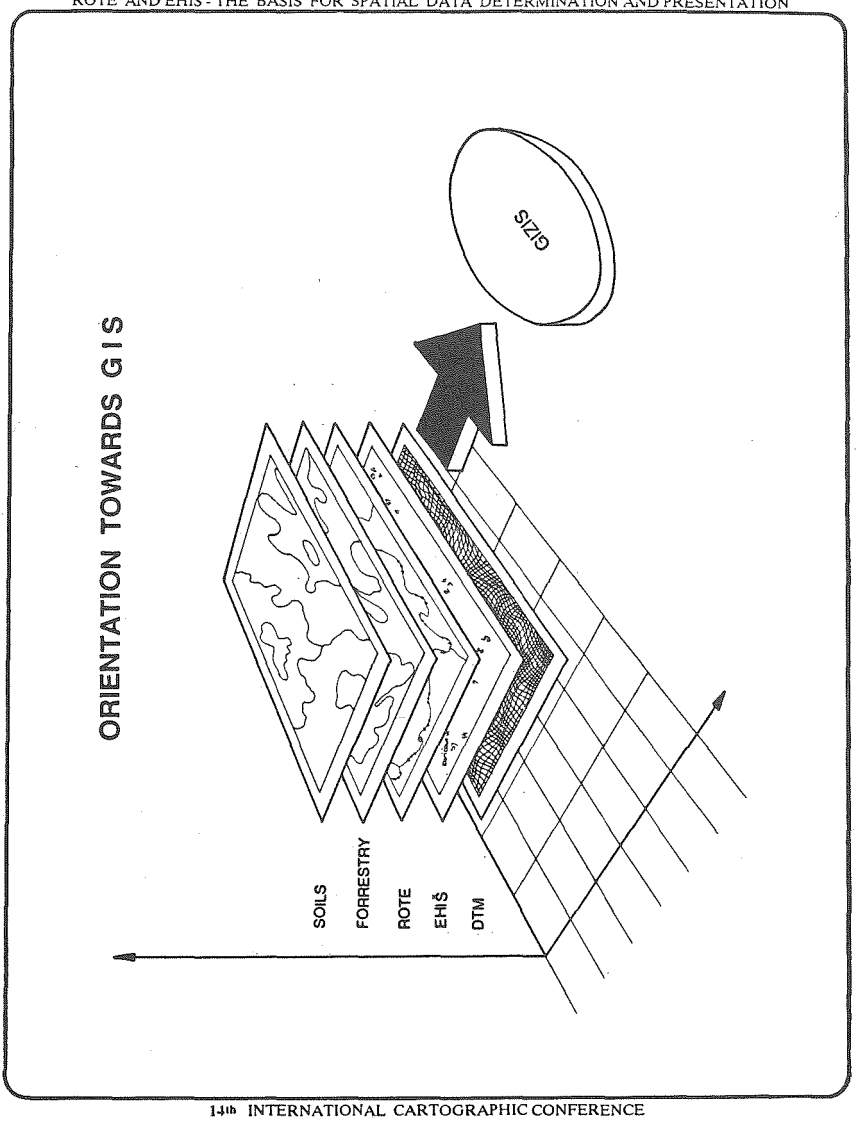

centroids of buildings with a house number represent geocoded databases. This form the basis for co-ordinate connection data and information presentation bound to territorial space division. Attached to space units and house numbers in co-ordinate form there will be also - next to geodetic data and statistics - adequatly adjusted data from agriculture, forestry, water works and supply, planning and others.

Merging and further development of the ROTE and EHIŠ into the Register of Spatial Units (Lipej 1988) will contribute - with geocodes and gradual decentralization of computer processing of these data in communes - to a higher level of data processing and to greater application of data collection. Because of their uniformity, the geocodes represent (Zakrajšek 1988) ideal identificators of other data and serve for verification of space position accuracy; data unchangibility in time anbles record keeping of changes of characteristics of other entities in various time intersections (for settlements, local communities,...). The geocoded data are a quality asset to linking and data transfer in communities and in the republic and for various data processing, syntheses, analyses, and projections in the framework of the Social Information System. The software for managing and maintainance of the Register of Spatial Units, which is beeing prepared (Rozman 1985-1988), is adopted for personal computers. It enables mathematical operations with territorial units, which are presented by a point, chain and areal: area calculations, neighbouring territorial units retrieval, addresing determination and graphics: territorial units field sheets, determination and window field sheets, gaining attribute information from the graphical one, the ROTE and EHIŠ data linkeage with data from other registers and records with field sheets in a form of thematic maps. In fact, the Register of Spatial Units represents a certain area of information system application, it is multi-intential and is either directly or indirectly accesible to various users.

In other Yugoslav republics and autonomous provinces the first phase is going on - to establish a similar system in this calendar year to be able to join the 1991 census of population of higher quality.

5. ORIENTATION TOWARDS GEOGRAPHICAL INFORMATION SYSTEMS

According to one definition, Geographical Information System (GIS) (Borrough 1987) is the powerful set of tools for spatial data collecting, storing, retrieving at will, analysing, displying and distributing. It is computer-aided information system which anables users (Chorley 1988) a rapid and simple access to large data qualities, mutual linking, analysing anda data modelling and evaluating of variant suggestions with a possibility of various forms of outputs such as plans, graphs, diagrams, lists and other statistical interpretations. The broad scheme of GIS enables its multi-intent application (Tomlison 1987, Chorley 1988) in planning, management, administration, public services, agriculture, forestry, land use, environmental monitoring, defence and security systems, transport, civil engineering, mineral exploitation, property and land parcel data and others.

Yugoslavia has not come far, yet. The Geographical and Land Registration Information System (GIZIS) (Infosistem 1988) project, which should establish databases of geocoded data in Yugoslavia, is still in its conceptual scheme. But first data in records and registers have to be adequatly readjusted and partly reorganized to be used in these systems. The ROTE and EHIŠ geocoded data are only the first step towards creating GIS in Slovenia and Yugoslavia. To achieve this the republic and communes must obtain hardware and software; they must reinforce additionally educate professional staff.

6. CONCLUSION

In Slovenia, the geodetic service (the Republican and individually Communal and Mapping Administrations) in connection with the Statistical Office of Socialist Republic of Slovenia have set up the ROTE and EHIŠ records. In the first phase they were updated in classical form. As the basis of the Register of Spatial Units they are

linked with other joint registers and databases in communes and in the republic. Territorial units and buildings with a house number represent - due to their uniform space location determination - the basis for spatial determination of various subjects in the Social Information System. The creation of geocoded databases for these records means a pioneer achievement in Slovenia e.g. Yugoslavia towards the realization of the planned project GIZIS e.g. GIS.

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