



HUNGARIAN GIS SURVEY SUMMARY



FURTHER INFORMATION ON INTERNET
URL:
<http://lazarus.elte.hu/gis/gissur97>

On the occasion of the AM/FM Conference at Budapest City Hall, Mr. Michael Brandt, President of the European Umbrella Organisation, EUROGI is presented with a copy of the Hungarian GIS Survey 1995.

Left to right: Dr. Szilárd Szabó (Editor-of-Chief of the Study), Dr. Gábor Remetey-Fülöpp (Secretary of HUNAGI), Mr. Michael Brandt, Dr. Rezső Berencei (Managing Director of HUNGIS)

FOREWORD TO HUNGARIAN GIS MARKET SURVEY 1997

OVER the last couple of years focus in the development of the information society has moved from physical infrastructure to multimedia information content. Geographic information is important content because it is essential for management and administration of any territory and because of its extensive use in a multitude of applications. Moreover, geographic information is becoming a commercial product in its own right driven mainly by the private sector. Facilitating both national and European markets for geographic information is in the interest of all nations in Europe both individually and together in the context of deeper European cooperation. In particular the European market can only prosper if there is a joint effort between the countries to ensure that activities mesh and are harmonious. For the countries in Central Europe such compatibility is especially important as this will facilitate their accession to the EU.

Any actor wishing to operate successfully in a competitive market must first acquire an in-depth understanding of that market through collection and analysis of basic market data. Also governments need such insights in order to be able to define and implement effective policies for helping markets develop.

Gaining this knowledge is precisely the purpose of the "Hungarian GIS Market Survey '97. It contains a thorough and both quantitative and qualitative analysis of the Hungarian market for geographic information including a comprehensive directory of the market actors in Hungary for geographic information.

Progress made in Hungary in the last years regarding geographic information has been very impressive. A national spatial data strategy has been accepted and everyone is now working enthusiastically towards its implementation. The fruits of these efforts are a market which has reached 20 MECU/year and is growing at 39% p.a.

Associations like HUNGIS and HUNAGI have been formed and they have quickly found their place in the international community through membership or links with similar supranational organisations such as EUROGI, CERCO, MOLA, GISIG and GSDI. This has also made it possible for Hungarian actors to take the lead in defining the ABDS project as one of the 30 pilot projects emanating from the Information Society Forum with Central Europe.

In the European Commission we are actively collecting market data for the emerging European market for geographic information with the same objectives as stated above. This report is an important piece in the puzzle for better understanding the greater European market.

I wish you, dear reader, much success from using this report.

—Martin Littlejohn

PATRONS



Martin Littlejohn
Head of Section in Unit
DGXIII E3
„Information Industries,
Awareness and Training”

Ferenc Somogyi,
Responsible State Secretary
for European Integration
Ministry for Foreign Affairs
HUNGARY

Miklós Havass
President of HUNAGI
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Prof. Ákos Detrekői
President of HUNGIS
HUNGARY

EDITOR'S PREFACE

THIS Survey is aspiring to promote the integration of Hungarian GIS-related companies into the international GIS community. To that end we try to provide foreign professionals with information which is most up-to-date and as comprehensive as it is possible.

This brochure summarises the essentials. A more detailed information is also available on the Internet. If you need a Complete GIS Market Study, please do not hesitate to contact the editor:

Dr. Szilárd Szabó

PART I.

ROLE OF THE STATE IN PROMOTING INNOVATION

THE role of the state – and local governments – in promoting innovation is interpreted in a number of ways. According to one approach the intervention of these is more harmful than positive, as in many cases such intervention results in solutions which are non-conform with market trends, are wasteful and the quality of the solutions often leaves quite a lot to be desired. According to another concept, modern state management needs efficient use of technology. Changes in the society and economy in the last decade, the intention to join the European Community and the NATO boosted enormously the value of handling information in space and in time and, in turn, these changes brought about an explosion-like growth in the use of GIS tools in community management.

The use of map-based systems is a question of strategic importance because it means intensive use of cutting edge technology; affects the whole economy of the country, provides possibilities to join the international information exchange and problem solving; it is an indispensable tool of improving the efficiency of community management, generates a considerable number of new jobs for example for surveyors, digitising personnel, etc.; if properly managed, expenses can be re-gained.

Although in Hungary recognition of the necessity of a national GIS policy is still far from being universal, nevertheless, there are steps towards this direction. A few examples will be highlighted below.

The National GIS Project financed by the National Committee for Technological Development (OMFB) was the most important action generating innovation. This Project in addition to support granted to definite projects of local governments shouldered the tasks of standardisation, digital mapping, GPS applications and crop estimation problems especially important in the view of joining the EU.

Computerisation of regional Cadastre Offices was also a strategic step. The National Cadastre Programme when completed will affect the whole national economy of Hungary. Tenders invited on applications of GIS technology in environment protection laid down the foundations of a consistent management of the environment. It has to be remarked that Hungary – via HUNAGI – is a full member of the international GIS community. This opens possibilities for establishing relationships with prominent organisations of persons of the European GIS community, information exchange and to represent Hungarian interests.

The most important governmental organisations and ministries and their activities are listed below¹:

Governmental Commission on Informatics and Telecommunications

This high level governmental body (GCIT) was recently established in order to supervise the planning and implementation of IT-related governmental activities with special emphasis on the Euro-Atlantic harmonisation.

Prime Minister's Office, Co-ordination Office of Informatics

Inter-ministerial Committee on Informatics (ICI)

Working Group on Geographical Information (WGGI)

The set up of WGGI was decided in late April 1997 by ICI with the objective to provide advice, consultancy and strategic support for ICI and GCIT in GI-related, higher priority issues. In WGGI, all governmental sectors listed below are represented. As first action of WGGI, the study entitled "GI in the Public Administration" was compiled in co-operation with HUNGIS Foundation and will be submitted to GCIT via ICI. WGGI is chaired by *Zsolt Sikolya* of COI. Main items in WGGI's working plans are: standardisation, data management, methodological issues, base maps and metadata database, Euro-harmonisation, evaluation (and later supervision) application project proposals having public administration importance (such as GI-based governmental information system, network-based service of DTA-50 digital topographic data, pilot on single window public service of selected municipalities and Cadastre Offices)

The ICI is headed by under-secretary *János Horváth*, who is also a promoter of the series of the Annual National GIS Conference devoted primarily for the public administrations.

Ministry of Agriculture (MoA)

Department of Land and Mapping (DLM)

DLM serves as the national land administration and mapping agency responsible among others for surveying and mapping related (legal, methodological, technological, R+TD, applications) activities, production, updating base maps, provision of land registration and related products and services. DLM supervises the operation of 19 County and the Capital Cadastre Offices and their 116 District Cadastre Offices. The basic R+TD institution of MoA/DLM is the Institute of Geodesy, Cartography and Remote Sensing. DLM as NMA is member of CERCO, founder of MEGRIN and provides significant infrastructural support for HUNAGI. In close cooperation with the Mapping Agency of the Hungarian Home

¹ Source: *Remetey-F. G.*: GI NETWORKING, META DATA BASE BUILDING, INSTITUTIONAL CONTEXT, MAIN DATA SOURCES,

Defence Forces, MoA and the MoD prepared the Law on Surveying and Mapping Activities and its related high level regulations which are now in force since 1st quarter of 1997.

Major projects are:

- ❖ Maintaining and developing the reference networks
- ❖ Computerisation of the Cadastre Offices (PHARE)
- ❖ Renewal of the cadastral map base for the Capital (Hungarian-Swiss bilateral)
- ❖ GI-supported land consolidation (Hungarian-Germany bilateral)
- ❖ Single window public service (pilot project)
- ❖ Administrative boundary data service (under refinement)
- ❖ National Cadastral Program (ready for implementation)
- ❖ Hungarian Topographic Data Program (definition phase).

The cadastre, landuse, agriculture sector is a huge user of GI. Potential application areas are as follow:

- ❖ Land tenure policy (incl. land valuation, land use monitoring, land market analysis, mortgage monitoring etc.)
- ❖ Agricultural statistics and economical analysis
- ❖ Rural development incl. landscape protection
- ❖ Supervision and control of agricultural subsidies
- ❖ Agricultural environment and nature protection
- ❖ Sustainable forest management
- ❖ Crop mapping, development monitoring and yield estimation
- ❖ Soil Information and Monitoring System applications

Most important data of companies

Name	Code	Postal Address	Leader's name	Position
Alföld	5000	Szolnok, Kossuth L. út 2.	Németh Róbert	president
Carto-Hansa	1149	Budapest, Bosnyák tér 5.	Ringhofer János	CEO
Cartographia	1443	Budapest, Pf.: 132.	Dr. Papp-Váry Árpád	CEO
Dasy	1537	Budapest, Pf.: 446.	Dr. Kiss István	CEO
Eurosense	1191	Budapest, Üllői út 200.	Dr. Gross Miklós	vice-director
Expo-Geo	1095	Budapest, Soroksári út 16.	Érdi-Krausz György	CEO
Flexiton	1117	Budapest, Prielle K. u. 4.	Ujvári Zoltán	CEO
Geocomp	1016	Budapest, Gellérthegy u. 30-32.	Németh J. András	CEO
Geometria	1025	Budapest, Felső Zöldmáli út 128-130.	Szilágyi János	CEO
Geoview	1137	Budapest, Radnóti Miklós u. 2. V.em.	Farkas Ferenc	CEO
InfoGraph	1145	Budapest, Columbus u. 17-23.	Tóth Zoltán	CEO
ISIS	1023	Budapest, Török u. 6.	Dr. Elek István	CEO
L&MARK	1027	Budapest, Fő u. 6.	Dr. Lisziewicz Zsolt	CEO
MÁFI	1442	Budapest, Pf.: 106.	Brezsnyánszky Károly	director
MH TÉHI	1525	Budapest 114., Pf. 37.	Cseri József	head of office
piLINE	1034	Budapest, Bécsi út 126-128.	Rudas Pál	CEO
Rudas&Karig	1024	Budapest, Szilágyi E. fasor 5. I/3.	Karig Gábor	CEO
Stewart	1021	Budapest, Hűvösvölgyi út 54.	Szabó Zoltán Gábor	CEO

- ❖ Supporting the sectorial EU talks by geospatial, and temporal data.

The UN FAO sub-regional centre for Central- and Eastern Europe was established in Budapest, in 1996. In order to support sustainable development in agriculture and forestry, FAO is ready to provide know-how transfer (including GIS/RS technologies).

Ministry of Domestic Affairs

Hungary has about 3200 settlements. Due to the financial and methodological support provided by the National Committee on Technological Development in the framework of the GIS National Program during the last several years, local governments has become major users of GI systems and related services. In framework of the project, 30 GIS based urban/settlement information management systems have been implemented taking into account the Digital Base Map standard elaborated in multidisciplinary board of professionals and officially issued last year. It is anticipated, the new Law on *Territorial Development* will significantly impacted the applications of GI by the county level public administrations. Certain counties are already active in this field. The partnership of Local Governments and the Cadastre Offices is to be encouraged because of openings new ways and innovative solutions toward network based public services. Base maps for these kind of applications are available in the 1:1000 - 1:50 000 range, where the DTA-50 as product is already available in digital form.

Ministry of Defence

In accordance with the decision made by the Hungarian Government in August 1996, as the legal successor of the Tóth Ágoston Mapping and Military Geographic Institute, the *Mapping Agency of the Hungarian Home Defence Forces* has been established. In conformity with the Act on Surveying and Mapping. The Agency has also gained executive tasks, especially in the field of traditional and digital topography and cartography. Today marketing data and products for civil sector is the priority tasks. DEM's, mid- and small scale topographic products are marketed for use in the public and private sector communities.

According to a recent law the Ministry of Defence and the Ministry of Agriculture are to co-operate closely in setting standards, establishing legal regulation for the Hungarian Topographic Programme.

Ministry of Industry, Commerce and Tourism

The utility companies have the most advanced GI infrastructure in the user community.

Equipped with and operating the latest high-tech facilities as well as served by system and solution provider SMEs with custom-tailored application software, the privatised regional electricity, gas, water and sewage works are the most dominant users in the Hungarian GIS market. Functionality, data and security, interoperability are common requirements. Huge companies in the tourism, transportation, telecommunications and non-renewable resources management including

the oil industry represent steadily growing market segment. The Hungarian Geological Survey/Geological Institute of Hungary (MÁFI) is using GI in many of its activities ranging from protection of environment through land use to the inventory of natural resources. The map-based concept has become its traditional approach during the past more than 125 years of existence. MÁFI entered in the digital thematic mapping in the early 90's and today implements projects in environmental, hidrogeological, geochemistry applications, providing consultancy and services also for municipalities, public utilities (e.g. power plants), site selection for waste depositories and regional civil-engineering works using GIS. MÁFI has leading role in the consortium working on the multipurpose *Aerial Survey of Hungary Project* initiative.

Ministry of Transportation, Communications and Water Management

In transportation, the country-wide inventory of public roads is a fundamental tool for traffic analysis. While the Data Bank on Public Roads (OKA) has limited geospatial analysis capability, the integrated, advanced CIVITAS database has already full GIS functionality using digital map products in the medium scale range.

The Hungarian Railways has the intention to establish its GIS-based property inventory using large scale digital maps.

The *Communication area* is mostly interested for the DEM and land cover data (using 14 classes nomenclature). The use of these data in GIS environment is operational.

Table 1.

Phone	Telefax	E-mail	GIS executive	Phone
(3656)-420-018	(56) 344-706	alfold@alfoldgis.hu	Zombori Zoltán	(56) 420-018
(361)-363-1401	363-1401		–	–
(361)-363-3649	363-4639	–	Tóth Tamás	220-6490
(361)-212-4124	212-5712	dasy@compuserve.com	Dr. Megyeri György	212-4124
(361)-282-2019	282-9574	–	Csécs S., Knyihár A.	282-2019
(361)-215-1781	215-4529	–	Fazekas Zoltán	215-1781
(361)-206-5141	206-5142	flexiton@mail.matav.hu	Fenyver Ezsébet	206--5141
(361)-202-3178	202-3178	geocomp@ind.eunet.hu	Hárs János	156-9122/362
(361)-325-6490	325-6491	postmaster@geometria.hu	Gánics Miklós	325-6486
(361)-112-7072	112-6861	andras@bp.geoview.hu;	Nikl István	112-7072
(361)-363-7697	363-7697	infogrph@mail.elender.hu	Tóth Zoltán (Szilágyi Gy.)	363-7697
(361)-315-0090	315--0141	isis@mail.datanet.hu	Pandiné Szegedi Szilvia	315-0141
(361)-201-7725	201-7725	sicad@Lmark.hu	Vuleta Róbert	201-2011/342
(361)-251-4680	251-0703	geo@mafi.hu	Turczi Gábor	220-6194
(361)-332-0161	212-2756	–	Sass Sándor	212-2744
(361)-368-2003	168-9039	support@piline.hu	Nagy László	368-2003
(361)-316-0506	316-0506	emailer@rudaskarig.datanet.hu	Nagy Gábor	316-1097
(361)-316-2058	316-2059	–	–	–

The *Water Management area* is one of the most experienced sector in use of computer-aided data collection, analysis and reporting. GIS-based projects have been implemented in flood protection (ÁRTÉR), countrywide Water Management Information Database (OVTR), the water distribution/sewage utility information system for the settlements (TVIR) used also by the *National Water Authority* with spatial analysis and statistical reporting capabilities.

Ministry of Environment and Regional Policy

Integrated GIS called ITR featuring environmental and natural protection subsystems has been already introduced in the central and two sites in the regional institutional network. Using by the *Environmental Management Institute* a system for management of the dangerous waste deposits will be also upgraded to provide GIS functionality using the DTA-50.

Some of the infrastructure development including the new GIS-based information service offered for the governmental decision makers are subject of Inter-ministerial Committee on Informatics (ICI) support.

The regional policy and planning area has a great challenge due to the new Law. The implementation of the National Spatial Information System is the task of VÁTI.

In the *environmental protection area*, pilot projects in groundwater analysis, water quality assessments are underway and applications in soil/landscape degradation, pollution sources monitoring are to be mentioned.

At the *National Meteorological Service*, GIS based local area networks are at the analysis staff's disposal. Data on soil, topography, land cover will be also required and used.

The *UNEP's subregional GRID Center* was opened recently in Budapest at the Ministry of Environment and Regional Policy. It supports world-wide access to and free exchange of global and regional data, provides access to environmental data management methods and makes possible to use the GRID technology and archives in the national environmental surveys and environmental management.

Central Office of Statistics

GIS techniques are used at the COS since the late 80's. Recent GI-related projects are as follow: CD ROM products containing also mapping software for visualisation. The terrestrial statistics uses desktop GIS, where the upgraded, integrated version will be available later this year.

Rudas & Karig

Software Development and Consulting Ltd.

Rudas & Karig was founded on 1 January 1989. Even since its foundation, the company profile has been designing and developing geographical information systems, designing and building spatial databases and digitizing. Currently there are 11 graduate software developers working at the company, a ten-strong team performs the digitizing, and we employ 15-20 regular external staff for database filling. Concerning regular external staff we employ not only programmers, but graphic artists, cartographers and surveyors.

We have gained good practice and great experience in the use of several geographical information systems (e.g. MicroStation, Arc/Info). Working applications prove our ability to develop high quality systems.

We undertake activities within the following fields of GIS:



Local Governments
System designing, developing and producing special databases of geographical information systems



Tourism
Designing and developing (geographical information) systems



Producing complex databases
of geographical information systems and highly intelligent maps, digitizing, data capturing

Public Utilities
System designing, developing and producing special databases of geographical information systems



Nature conservation
Designing and developing (geographical information) systems



☒ 1024 Bp., Szilágyi Erzsébet fasor 5. I/3., ☎ Tel./Fax: (1) 316-0506, 316-1096, 316-1097, Email: emailer@rudaskarig.datanet.hu

National Committee for Technological Development (OMFB)

OMFB plays basic role in the research and technology development, providing for grant application oriented innovative solutions, keeps international contacts in scientific and technological co-operation with special emphasis on the European Union' institutions, programmes and project offices. After a study document of OMFB on the "Application of GIS" in 1991, the majority of the sectorial GI-related programmes were supported with grants by OMFB especially in the 1993-1996 time frame. Under the permanent support of Deputy Vice-President *Sándor Bottka*, the expert network and the co-ordination established by project manager *Vilmos Bognár* was so far a serious contribution to the development of the Hungarian GIS culture and progress. Among others direct beneficiaries were the following programmes:

- ❖ General-purpose GPS applications
- ❖ CORINE Land Cover Database infrastructure development
- ❖ DTA-50 Digital Topographic Database product
- ❖ Introducing Municipal GI Systems at Local Governments
- ❖ Standardisation and methodological development for large-scale digital mapping
- ❖ Crop yield estimation based on vegetation mapping and development monitoring (by EU-harmonised way)
- ❖ Multipurpose Aerial Survey of Hungary (member of the consortium, in definition phase), etc.
- ❖ The ABDS initiative of OMFB, the build up the Administrative Boundary Data Service in Central and Eastern European countries has received positive reactions from the Information Society Forum and relevant European Institutions. The way of implementation is subject of discussions on expert level.

Part II.: HUNGARIAN GIS DEVELOPERS

The fields of activity of the Hungarian GIS companies can be seen Table 2. The detailed subscriptions are the follows:

ALFÖLD INVESTMENT AND INFORMATICS CORPORATION



The name and logo of the firm is not the act of pure chance or a sudden idea. It refers to the area the infinite flat country the operates in; the great plain regarded as its homeland, as well as the space they live in. This name refers to the firm's philosophy too, for their aim is to present this area in its very reality in as many aspects as possible. People are shown this vividly illustrated land as an integral whole, certainly in accordance with their individual interest, business task and objectives.

The corporation was established in 1992. Co-ordinated work of three offices describes its organisational structure and operation. These units are the system developing, the investment and the information science offices. Five fundamental activity areas have been worked out at the firm:

- ❖ investment- settlement- and region development consultation
- ❖ project management
- ❖ systematisation
- ❖ space informatics improvements; consulting activity

❖ training and education.

On the top of all this the firm offers an unrivalled regional non-stop FaxBank service.

One of the firm's business sectors, the space information science, has been showing the most dynamic growth over the period since the company was established. Professionals of the firm aim primarily at the domestic introduction and spreading of this new branch of information technology.

The space informatics is that sector of information science which - with its unified projecting method - is intended to integrate broken up data spread among different ground locations and organisations into consistent resources. It is a computerised informatics system, based on carefully chosen maps, hardware and software devices, that maximally serve the given purpose. Files containing information tied to ground locations can be stored and managed with the above system. Due to our special high-tech technology and displaying instruments one is capable to produce space informatics systems of any scale, also to create and display digital map- or any other optional digital products of the kind. The future role of space informatics owing to its benefits will be fundamental, since the attainable advantages:

- ❖ exempt of redundancy
- ❖ quick and simple public administration relying on the objective basis of information science
- ❖ efficient corporate operation and development
- ❖ quick analysis for actual state of affairs, etc. speak for themselves.

In 1993 our firm ISC (Intergraph Solution Centre) signed a contract with the American Intergraph Company, the one which has based its space informatics platform on that widely

Company	System design	GIS software development	Application sw development	Hardware distributing	Software distributing	Digital surveying	Digital photogrammetry	Digital remote sensing	Digital cartography	Digital base mapping	Digital thematic mapping	GIS analysis, service	Consultancy	Professional direction	Project management	Education	Other
Alföld Rt.	⊕	⊕	★	⊕	⊕		★	⊕		⊕	⊕	⊕	⊕	⊕	⊕	⊕	
Carto-Hansa							★			⊕							
Cartographia									★	⊕	⊕						
Dasy	⊕		★		⊕					⊕	⊕	⊕	⊕	⊕		⊕	
Eurosense			⊕				★	⊕	⊕	⊕	⊕	⊕	⊕	⊕		⊕	
Expo-Geo						★				⊕	⊕						
Flexiton	⊕				⊕					★		⊕	⊕	⊕		⊕	
Geocomp	⊕		⊕		★					⊕	⊕	⊕	⊕	⊕		⊕	
Geometria	⊕		★		⊕				⊕	★	⊕	⊕	⊕	⊕		⊕	
Geoview Systems	⊕	⊕	★	⊕	⊕				⊕	⊕	⊕	⊕	⊕	⊕		⊕	
InfoGraph			⊕		⊕				★	⊕	⊕	⊕	⊕	⊕	⊕	⊕	
ISIS																	
L&MARK	⊕		★		⊕							⊕	⊕	★	⊕	⊕	
MÁFI									⊕			★	⊕	⊕	⊕	⊕	
MH TÉHI										⊕							★
pILINE	⊕	⊕	★		⊕					⊕		⊕	⊕				
Rudas&Karig	⊕		★		⊕					⊕		⊕	⊕	⊕	⊕	⊕	
Stewart	⊕											★			⊕		

Legend: ★ main profile

⊕ other significant activities

known MicroStation which is one of the most popular CAD software. Accordingly, we have large measure of chance for the implementation of GIS (Geographic Information System) systems. They range from PC basics through UNIX work terminals to solo instruments and customer serving networks. The applications developed by the corporation can be run on innumerable hardware and software platforms most frequently used in Hungary. It is possible for our customers to choose from a whole set of nearly ready-made solutions; mechanical engineering, health care, construction, civil engineering, public utility management and planning, settlement administration, road planning, etc. ...from practically any field of life.

Four significant user groups represent the firm's activity up till now:

- ❖ local authorities
- ❖ research institutes, non-series innovations
- ❖ public-service corporations
- ❖ educational establishments

The life and soul of the firm's non-stop FaxBank service is such a data processing centre that is capable of storing of several-thousand-page facsimile text, meanwhile it is being transferred to the caller's fax machine. Partners can easily place their business leaflets, price offers, advertisement material etc. on their individually opened pages in the FaxBank. To the request of customers, with the help of a separate web server the firm can also place any information stored in FaxBank on the Internet. If required, the edition of independent web page is undertaken as well.

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Further information on Internet

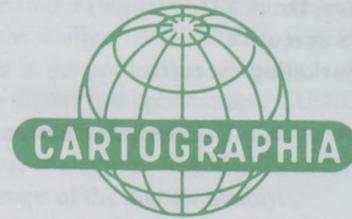
CARTOGRAPHIA LTD.

The predecessor of Cartographia Ltd., the Cartographia, Hungarian Company for Surveying and Mapping was established on 1st December 1954. Its present circle of activity was set up after several processes of reorganisation.

After 1st January 1959 Cartographia's profile has been widened by unifying of different sections with geodetic activities, as topographic surveying, photogrammetry, drawing of topographic maps, as well as a Printing office of small capacity. The initially 90 people strong staff of Cartographia nearly quadrupled by today.

Since 1969 Cartographia has got the rights for foreign trade activity. This made possible the building up of large partnership and good relations almost in all countries of Europe.

By knowing the foreign partners and their requirements as for quality, style, high level technology, and in order to keep the competitiveness on the foreign market Cartographia has made large investments of advanced technology and utilising modern devices in the production-process.



Since 1991 the geodetic departments were detached from Cartographia and on 1st January 1993 the company was registered under a new name: Cartographia Ltd.

In order to keeping the high standards of production, the standing developing of its equipment's park was setting for target according to the newest demand and the modern technical requirements. It possesses a modern „Hercules” image-setter, utilises Intergraph, Macintosh and PC computers work in the production. Besides compilation, drawing, planning, editing, which demand very precise work and accuracy, it produces lithographic drawing and printing, and ready-to-print map-films and reproduction works in good quality.

It succeeded maintaining the good relationship with the ancient partners and also continuously widening its business contacts with new ones.

The first export products like the atlas made for the French Larousse, the atlas-pages for the American Rand McNally based Cartographia's reputation. These commission-works were followed by new map-orders of the well-known companies, among others Freytag-Berndt (Vienna), Hallwag (Bern), Falk Verlag (Hamburg), the German Ravenstein Verlag, which are also proof of their recognition.

Cartographia Ltd. is a great name in cartography. On its product-pallet figures a great number of school atlases, wall-maps, guide-books, tourist maps, foreign city maps, road maps, different atlases which are at high level, and they have been distributed with great success all over the world. A wide range of descriptive, technical maps of Cartographia Ltd. help experts in the field of economy, science and education. Thanks to opening to multimedia, Cartographia Ltd. presented the Budapest CD-Atlas in 1996 and Hungary CD-Atlas in 1997 as the first two member of its CD-Atlas series. The presentation, richness of contents and the quality are at West European level. The Cartographia-products are popular also because of their competitive prices. Year for year it enters into new business relation with foreign partners as well. At present Cartographia Ltd. has world-wide contacts and large partnership on the five continents. Its most important business partners are from America, Israel, South Africa and Australia. Cartographia tries to satisfy the growing demands of customers and aiming progressively widen the circle of its partners.

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Further information on Internet

CARTO-HANSA GEODETIC AND GEOGRAPHICAL INFORMATION SYSTEMS SERVICES LTD.



The company is engaged mainly in photogrammetry and map digitisation. The photogrammetric activities are covering both aerial and terrestrial photogrammetry, including phototriangulation by bundle adjustment, photo restitution, interpretation and digital stereo-plotting at any scale. The stereo-plotters used for these purposes are both analogue and analytic. Another field of occupation is map digitisation using high accuracy digitising tablets and on-screen vectorising programs for raster scanned map materials. The platform for most of their digital mapping assignments is Intergraph MicroStation while the output is DGN format suitable for geographic information systems as a 3-dimensional base map.

Some of the recent contracts

- Digital survey of the XXth District of Budapest, 1991
- Bangkok airport development scheme: digital stereoplotting from aerial photographs, mapping scale 1:500 for 3-D planning map. 1992-1993.
- Greifswald township mapping digital stereoplotting from aerial photographs, mapping scale 1:500, plotting of situation and contours, digital integration of field completion data. 1993-1995.
- Jena, Wuppertal, Schwarzenberg, Suhl, Artern township mapping digital stereoplotting from aerial photographs, mapping scale 1:1000, plotting of situation and contours, 3-dimensional detailing of building roofs. 1993-1995.

Yearly contract earning is around 65 million Hungarian Forints.

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Contact persons:

János Ringhofer CEO

Further information on Internet

DASY DECISION AND SYSTEMS MANAGEMENT LTD.



Founded in 1989, DASY Decision and Systems Management Ltd. is a Hungarian-British joint venture.

The British partner, SAMII Ltd., specialist in business and change management, closely monitors the new methods, insures the speedy procurement of tools available outside of Hungary.

Within DASY the following areas have been especially active.

Consultations in Business

An important and growing part of DASY's corporate practice involves works with clients on several aspects of business, acting as consultant or intermediary in development and implementation. The Firm has increased activity in the franchise-type systems, which is a brand new business in Hungary.

Change Management

The adoption of new technologies, the restructuring of corporate, or the reorganisation of institutes requires the planning and managing change. DASY prepares strategic decisions, examines the organisational impact of the result, gives support to implement successfully changes within companies, organises seminars and courses of different level on the area.

Decision Support

The Firm is prepared to provide the newest methods, the results of the relevant research studies, technical help, consulting services and training to the point of application of these tools and concepts. DASY develops new decision support products or modifies and implants existing ones according to the client's needs or specifications.

Environmental Assessment

Environmental planning and management require extremely complex tools, database management, geographical information system, modelling and simulation methods, individual or group decision support. Positioning itself in the forefront of innovative computer-based approach to environmental assessment, DASY has developed integrated frames permitting the simulation, forecast, evaluation, and display of environmental impacts. The Firm develops ready-to-use program systems or provides services in environmental activity.

Data Organisation

Businesses, institutions want to answer local questions based on customer distribution, buying power, buying history, advertising efficiency, competition distribution, least-cost routing and delivery, etc.

The integrated non-graphical and graphical databases contain all the data necessary to support applications. DASY's activity includes the user needs assessment, conceptual design, physical design, pilot study and final implementation.

The Company's associates are experienced in computer systems, operating systems, and generally used programming languages. They are fluent in English, German, French, Polish, Czech, Russian, Vietnamese.

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Further information on Internet

EUROSENSE LTD.



Company profile

Eurosense Ltd. is a member of the Eurosense company group. Eurosense is probably Europe's most prominent commercial remote sensing organisation. Eurosense has one of the world's most advanced high technology map and image production facilities at its disposal, with a surface of over 10 000m². The enterprise has branches in Belgium, The Netherlands, Germany, France, Hungary, The Czech Republic, Slovakia, Poland and China.

The Hungarian company, Eurosense Ltd., was established in 1993. All services offered by Eurosense Ltd. are fully integrated within the company: aerial photography, photo-interpretation, processing and interpretation of digital satellite images, production of photogrammetric and topographic maps, GIS/LIS and AM/FM-database development and consultancy, inventory of forests and natural resources, digital orthophotography, environmental studies and lots of other activities.

All production steps, from the photography up to the finalised product, are fully integrated within the company, in order to meet highest standards for quality, precision and reliability.

Eurosense Ltd. operates own twin-engined survey aircraft equipped with a highly precise satellite navigation system (CCNS), based on GPS. The aircraft is provided with two camera and scanner holes. Eurosense Ltd. has a Wild RC 30 camera with FMC and the Kodak Ektachrome RT Model 1811 developing machine for colour and infrared films.

For the stereophotogrammetric works Eurosense Ltd. has a Vision's Softplotter (digital photogrammetric workstation).

Thanks to the unique EUDICORT[®] system, Eurosense is a world leader in the production of colour, colour infrared, and black/white digital orthophotomaps. EUDICORT[®] allows to perform very precise radiometric and geometric corrections, and to mosaic the images digitally, in order to obtain digital orthophotomaps of the highest quality.

Since 1994, Eurosense Ltd. has produced several hundreds of digital orthophotomaps for different Hungarian clients, on various scales (1:10 000–1:1000) and on various ground resolution (1m–20 cm).

The most important projects of Eurosense Ltd.

Colour digital orthophotomaps of 89 Hungarian sites for the Mapping Agency of the Hungarian Home Defence Forces.

Colour digital orthophotomaps for several city municipalities (Budapest, Szolnok, Békéscsaba etc.)

1-m resolution colour digital orthophotomaps for several hundreds km² for environmental protection and territorial development planning

High resolution (30–20 cm) colour and infracolour digital orthophotos for different local planning purpose

High resolution colour digital orthophotos for digital cadastral mapping for more than 40 000 ha

The services of Eurosense Ltd.

Colour, colour infrared and black/white aerial photography

Production of colour, colour infrared and black/white digital orthophotos with different ground resolution

Photo-interpretation

Processing and interpretation of digital satellite images

Digital photogrammetric production

Digital large scale and topographic mapping

Digital cartography

Hydrography

Environmental studies

Equipments

Twin-engined survey aircraft

Computer Controlled Navigation System with GPS

RC 30 photogrammetric camera

Kodak Ektachrome RT 1811 developing machine

Digital photogrammetric workstation

HP and SGI image processing workstations

DOS and NT PC workstations

Digital data

Eurosense Ltd. can provide digital vector and raster data for a whole series of systems and applications.

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Sándor Csécs, András Knyihár GIS executive

Further information on Internet

EXPO-GEO LTD.



As an independent organisation for the co-ordination of surveying works and engineering surveys of the Budapest World EXPO, the Expo-Geo Co. Ltd. has been established.

After cancellation of the World Exhibition, Expo-Geo continued its activities in the fields of engineering surveys and GIS technologies.

The most important activities are as follows

- site measurements,
- topographic data acquisition and processing,
- special surveying activities for architectural design,
- surveying and precision measurement for the industrial sector,
- digital base map production,
- digital data base of public utilities.

Important projects

- Preparation of EXPO '96 World Exhibition (surveying and GIS)
- Engineering surveys on the building operations of the „Lágymányos” new university area
- Surveying and digital mapping of Grassalkovich Castle Park, Gödöllő and complete internal survey for architectural design

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Contact persons:

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Zoltán Fazekas GIS executive

Tamás Csizmadia marketing executive

Further information on Internet

FLEXITON LTD.

FlexiTon

FlexiTon Ltd., a Finnish-Hungarian joint venture, was established in 1990. The company is registered in Budapest.

Significant projects and references

BALATEL Rt. (A telephone operator company in Hungary)
Delivery of the GIS-based BIS Network Management System including the map base and network data of the Siófok Primary Region

MATÁV Rt. (The Hungarian telephone-and telecommunication company of the State)

Creating the digital map base with utility information and the strip maps between settlements of Zalaegerszeg, Kaposvár, Marcali, Nagykanizsa, Szigetvár, Pécs Primary Regions

MT TELECOM Kft. (Telephone network designing company in Hungary)

Creating the digital map base with utility information and the strip maps between settlements of Dunaújváros, Szigetszentmiklós, Veszprém Primary Regions

ERICSSON Kft. (A telephone network designing and building company in Hungary)

Creating the digital map base of the Szekszárd Primary Region

DIALCONT Kft. (A telephone network designing company in Hungary)

Creating the digital map base with utility information and the strip maps between settlements of Békéscsaba, Orosháza Primary Regions and Budakalász

NETCOM CONSULTANTS AB (A telephone network consulting company in Sweden)

Digital terrain model of Singapore and some parts of India

RIIHIMÄEN PUHELIN OY (A private telephone company, Riihimäki, Finland)

Creating the digital map base of Riihimäki for the GIS based network management software, vectorisation of schematics

MARTIS OY, 1990-1994 (A special telephone network equipment manufacturer in Finland)

Network management software specification, implementation, documentation for special telecommunications trunk network. About 220 man-months. Written in Microsoft C 5.1 for OS/2 Presentation Manager, in SQL environment.

NIZNEVARTOVSKNEFTEGAZ (Oil company in Western-Siberia, Russia)

Delivery of GIS and EDM systems.

UNITED TELECOM INVESTMENT

(Telephone and telecommunications company)

Delivery of the GIS-based Network Record System including the map base and network data of Szigetszentmiklós Primary Region.

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Further information on Internet

GEOCOMP LTD.



Established in 1989, GEOCOMP Ltd. is the Hungarian representative and authorised distributor of Environmental Systems Research Institute Inc. (ESRI, California, USA) Present owners are KFKI Számítástechnikai Rt. (Computer Division of the Central Research Institute for Physics in Hungary) and the Dangermod's (founders and president of ESRI).

GEOCOMP consists of three small divisions: a Sales/Marketing Department, a Technical Division, and Administration. Among Geocomp's line of equipment are workstations (including RISC processors) connected by an Ethernet network with Windows-based PCs, and virtually all accessories needed for delivering GIS related services: digitizer tables, large size scanners, plotters and printers.

Geocomp's activities are designed to meet every need related to the use of ESRI products in Hungary, including consulting services, technical support, basic and customised GIS training, application development, database design, data entry, and sales/marketing. Among the market-leaders of the Hungarian computing industry, KFKI Group subsidiaries perform a wide array of activities, granting GEOCOMP – a member – the capability of carrying out tasks of great complexity requiring system integration. In addition, ESRI's world-wide network offers numerous opportunities for international Cupertino with other participating organisations.

Among GEOCOMP's on-going activities are:

- Exclusive Representation of ESRI in Hungary as an Authorised International Distributor;
- Participation in the EGIS project (in international Cupertino) for the EU;
- Participation in the COPESTAT project (in international Cupertino) for the EU.;
- IT consultation for Public Administration;

- Support for the Hungarian Electoral Systems;
- Informational System for the Hungarian Central Government and MPs, co-ordinated by the Ministry for Environment and Land Development, with the Cupertino of the Ministry for Infrastructure and Water Management and the Central Statistical Office.
- GIS application design and development for Local Governments:
- XIV. District (Zugló), Budapest,
- IV. District, Budapest;
- GIS components of various Urban Planning projects, consultation and expert analysis: Urban Development Division of the Budapest Local Government, BUVÁTI Inc., VÁTI Inc., URBANCONSULT Ltd.;
- Data conversion from earlier records of ARC/INFO Digital Base Map Data into Caddy programs for the Budapest Land Office;
- Design System for Cordless Microwave Connections, Hungarian Telecommunication Company;
- Public Utility Register System for Csepel Works, Budapest;
- Emergency Break-down Information System Pilot Project for the Budapest Gasworks;
- Feasibility study for an AM/FM of the Hungarian State Railway Company;
- Feasibility study for the application of GIS in the project management of transportation;
- Support for the Research Program of the Boda Aleurolite Formation;
- Multitemporary analysis of air pollution in Budapest;
- Sample Information System of Urban Environment for Human Health in the VIII. district of Budapest;
- Data conversion services for the Hungarian Army's Mapping Agency;
- Conversion of 1:50 000 Digital Topographic Maps (DTA-50) to ESRI's „SHAPE” format.

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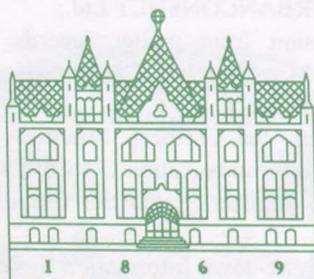
Further information on Internet

GEOLOGICAL INSTITUTE OF HUNGARY (MÁFI)

Activities

Two principal aspects can be distinguished in the GIS activity of the Geological Institute of Hungary. First of all, it is responsible for providing services for other departments of the Institute and the Hungarian Geological Survey. This objec-

tive is achieved by processing data of geological mapping projects in GIS. Priority is given to the establishment of GIS databases through digital acquisition of geological information available throughout the country, their processing and analysis facilitating computer-assisted output of thematic base- and derived maps on the scale and from the area required by the customers of the Institute. One of the main aspects of their GIS activity is to elaborate standard procedures for map processing and uniform legends enabling a broad range of customers to use and interpret their products. The main advantage of standard procedures is that thematic maps of any part of the country have consistent legends.



Throughout the recent years the environmental aspect of geosciences gained much importance. Following this trend, the Geological Institute of Hungary has been putting great emphasis on GIS processing of its large amount of data for addressing environmental issues. They include land use management, deposition of communal, industrial, agricultural and radioactive wastes, assessment of local and regional water supplies, assessment of the effects of industrial and agricultural activity and large constructions on the environment, monitoring the regime and quality of ground- and deep, subsurface water aquifers. These are some of the major environmental problems that cannot be addressed and reliably solved without the database and the professional knowledge of experts of the Geological Institute. Related base data is available in its data archive, whereas GIS technology provides the indispensable tool for experts to integrate them into a topologically structured multidisciplinary database. Its sophisticated analysis results in producing specific, derived maps for decision making.

Apart from providing services for mapping projects, the GIS group of the Geological Institute puts an ever-growing effort in realising projects on contractual basis. It is the second, but increasingly important aspect of its activity. Major customers include the Ministry for Environment and Regional Policy, the Paks Nuclear Power Plant and municipal authorities. The Institute's most recent project was aimed at setting up the digital geoscientific database of the surroundings of the Paks Nuclear Power Plant and selecting potential sites for its radioactive waste depository through the integration of favourable and unfavourable criteria.

Activities undertaken on contractual basis includes the construction of any non-geological GIS database, such as electronic processing of cadastre- and public utility data for municipalities. Recently the Institute have been involved into the digital acquisition and database construction of the system for parcel- and real estate management of Orosháza city. It is the field where the Institute will concentrate its efforts in the fu-

ture, namely, to be engaged in digital processing of cadastre- and public utility data and providing digital data for telecommunication projects.

By using both of the leading industry standard GIS software (Intergraph and ARC/INFO), they provide customers with digital data in any standard data format existing in the market.

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Further information on Internet

GEOMETRIA GIS SYSTEMS HOUSE



Geometria GIS Systems House was founded in 1986 as an independent private company to develop and supply Geographic Information Systems. Geometria is the GIS market leader in Hungary. Geometria took part in the development of the Hungarian GIS market performing a leading role. The non-profit-like activity of Geometria, which included the introduction of professional panels, the support of professional education, the foundation and support of professional organisations (HUNGIS, HUNAGI), significantly contributed to the market development.

Apart from Geometria's domestic business a large proportion of Geometria's business is in EC countries. The company started its export activity in 1991. They based Geometria's business competitiveness on favourable prices and quality services. In the frame of the export activity they sold services in Germany, The Netherlands, Austria, Italy, Sweden. Beyond these countries Geometria's products are used in Belgium, Czech Republic, Russia. Among Geometria's contractors there are public authorities and private companies.

In the frame of the focusing marketing activity in 1995 they established a subsidiary in The Netherlands which is 100 % owned by Geometria.

The company increased its capacity gradually. At present the company's expert teams (85 professionals) offer GIS services ranging from map data conversion to basic and application software development.

Geometria's activities are characterized by the following:

- technologically advanced production, continuous innovation
- complete solutions
- highly professionals skills
- reliability
- continuous quality control

Geometria's activity is the combination of the engineer's thinking fused with state of the art technology and information technology.

Geometria's employees are 85 of which 35% perform system developing and 65% data capturing. 60% of Geometria's employees have high degree qualification connected with their activity.

Geometria's services include:

Map Data Conversion

Over 40 professionals convert maps with manual, semi-automatic and automatic procedures including attributing, pre-processing and plotting. All these processes undergo rigorous quality control tests. Service includes customer specific technology development and rule-base to exclude erroneous data already in the input phase. References include the National GIS Database of Hungary, the 1:10.000 topographic map of The Netherlands and Denmark. They have special expertise in topographic and cadastral mapping, facility management for utilities, road database creation for car navigation purposes and remote sensing editing.

The GIS database production activity of the company has an ISO 9001 documented quality assurance system certified by TÜV Rheinland.

Application Software Development

Through many years of experience, as recognised leader of implementation of utility network management systems, Geometria develops complex turn-key solutions. During the development of such systems Geometria co-ordinates all implementation processes which guarantees the quality of each system element to be fit for the demand. Offering complete solutions the following tasks are solved by the company : problem and task definition, system design, software development, database creation, acquisition of hardware, system implementation, training, system monitoring and updating information.

Geometria is an Intergraph Solution Centre and an Intergraph Independent Software Developer. There are Intergraph Registered Consultants in-house for FRAMME & GIS Mapping (MGE). Geometria a Bentley Business Center and a Oracle Value Added Relicensor.

References include cadastral (Hungarian Land Offices), electric (Budapest Electricity Board), gas (Central Transdanubian Gas Distribution Company), district heating (Budapest District Heating Company), water supply (Budapest Water Supply) and telecom (Hungarian Telecom, Swedisch Telecom) projects both under FRAMME and MicroStation MDL.

GIS Software Development

Geometria, in co-operation with Dornier GmbH, a German Aerospace Company, developed topoLogic GIS software which is a vector GIS system and function library with built-in digital terrain modelling for Microsoft Windows and UNIX. topoLogic represents an integrated part of a bigger information system developed by Dornier GmbH to order of the German Ministry of Environment for measuring environmental radioactivity (IMIS: Integrated Measurement and Information System for Environmental Radioactivity). In the frame of the cooperation topoLogic is used in more than 200 workplaces (Switzerland, Belgium, Germany, Czech Republic, Sweden, Denmark, Russia etc.)

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Further information on Internet

GEOVIEW SYSTEMS LTD.



The company provides customers with the full scale of services related to geographical informatics (GIS) from pre-development consulting through the realisation of turn-key network systems loaded with mapping and other data to education and training.

The main profile of the company includes:

- Standard GIS system (*GreenLine*) development and marketing/sale in the German-speaking countries
- City management
- Public utilities, Energy supply, registration of linear mode facilities, modelling, planning
- Telecommunications, telephone line registration, troubleshooting and management

The business activities of Geoview Systems Ltd. encompass two main target areas. The first one of them is that of standard GIS software and development environment supply, where as the result of a 50 man-year work the firm have succeeded in creating a fully object-oriented GIS development and running system baptised *GreenLine*. *GreenLine* is essentially sold in Germany through the GBI GmbH. firm under

the name MicOpen. At present, several German municipalities are starting up and testing GreenLine. According to the terms of a contract signed in 1996, the firm's dealer engaged himself to sell several hundred licenses per annum. The company maintains contacts with several leading firms, e.g. with Siemens in Europe or with Geovision, IBM and SUN Microsystems in the United States, to mention but a few. The company is a well-established, regular participant of the domestic Ifabo expositions and the Compfair IT shows. At Ifabo '91, Geoview's water management system won the prestigious Top Class Product award.

The other main field of interest of Geoview Systems Ltd. is application development. Here, in the context of municipal management systems, the company is the leader on the Hungarian market. They are working on the development of GIS information systems in more than 15 municipalities, among them 5 major towns and several districts of the capital.

Geoview Systems Ltd. has successfully entered the new market of realising public utility suppliers' systems. As the first step of this process, the firm realised the complete GIS registration of the gas network of the city of Hajdúszoboszló under a contract with TIGÁZ, while ÉGÁZ commissioned the firm to create the public utility registration system of Győr. In parallel, Geoview received an order from ÉDÁSZ Ltd. to prepare the GIS system covering its entire geographical sphere of competence (6 counties), a framework in which the firm developed the so-called Integrated Technical Information System (in Hungarian: the IMIR). With the aid of the IMIR, ÉDÁSZ Ltd. can register and keep track of their every network tool, ranging from the (low voltage) municipal network to the (high voltage) inter-municipal one.

From among the sectorial public utility systems, Geoview proudly mentions the outstanding feat of realising the Complex Sectorial Public Utility GIS of Hungary's one and only nuclear power plant located in Paks.

Current staff consists of approximately 40 professionals who graduated at various universities; some of them are working for the Győr Geoview division. Many of their experts regularly visit international expositions on computerised GIS, giving oral contributions or submitting publications (e.g. at the EGIS '90 First European Conference on Geographical Information Systems – "The Complex Land Information System of Budapest"; one can also mention the EGIS '93 – "GREEN LINE: The New Generation GIS at the Gas Services", a publication ranked as second best in its kind), too.

From the nature of the firm's work it follows that 80% of their engineers are fluent in English. 85% of the staff is less than 35 years old, dynamic and creative. This competent professional staff and the use of the latest software technologies guarantee that the firm's market share will continue to grow. Over the past 7 years, Geoview Systems Ltd. has developed a number of internationally acclaimed software tools. The most prominent ones include a map management module, a network management module, graphical analytical modules; their development is the result of cca. 50 man-years of work. The development process drew on the latest up-to-date technologies based on Windows NT, UNIX and OS/2, in both PC and workstation environments, at about 50 workplaces. The firm's systems operate in network environments, which per-

mits the realisation of extensive, even nation-wide systems. The systems are delivered with mapping data uploaded, therefore the computerised map of the country as well as that of Budapest and a few important cities – including all the postal addresses – are available. Data to the national database were uploaded in co-operation with the National Statistical Bureau and the municipality row-entry numerical NSB database (TSTAR) was linked to the map of the country.

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István Nikl GIS executive

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Further information on Internet

INFOGRAPH INFORMATIKAI SZOLGÁLTATÓ KFT.



Main activities of InfoGraph Ltd. are the following:

- Selling the National GIS Database (OTAB)
- Selling the presentation and overview levels of the Budapest GIS database
- Desktop mapping, Thematic mapping
- Selling MapInfo products as Authorised MapInfo Partner
- Development of "small" GIS application systems
- Spatial analysis, Site selection studies
- Geodesic applications
- Development of GIS and Desktop Mapping databases

Reference works

- Updating and transforming into WGS-84 system of the National GIS Database (Országos Térinformatikai Alapadatbázis, OTAB V. 2.1.), as well as the BUDAPEST-4000 (V. 2.0) Digital Map Database. Performed by the firm, 1995-1997
- Computerised system for assessing the suitability of transport routing patterns for issuing routing permits. Customer: Road Management and Co-ordination Directorate (Útgazdálkodási és Koordinációs Igazgatóság), 1995-1996
- Developing the AQUIDAT Geographic Information System and its digital map database. Customer: Aquincum Museum of the Budapest History Museum, 1996

- Producing digitised maps of Zalaegerszeg, suitable for processing in Geographic Information System. Customer: Regional Development, Urbanistics and Architecture p. 1. c. (Magyar Regionális Fejlesztési, Urbanisztikai és Építészeti Rt., VÁTI) 1996
- VÁRINFO, Geographic Information System for decision-making support, registration and management of Buda Castle Hill's (Polgárvaros area) technical base data. Customer: FŐMTERV Rt. – Budapest I. District Self-government, 1996
- DTA-50 V. 1.0 Digital Topographic Map in MapInfo format. Customer: Cartography Office of the Hungarian Defence Forces, 1997
- Geographic Information System of the National GPS Network's data bank. Customer: Institute of Geodesy, Cartography and Remote Sensing (Földmérési és Távérzékelési Intézet) 1997
- Producing the digitised maps for the Official Inter-city Bus Directory and developing the database of the Directory. Customer: VOLÁN Association 1997
- Developing the Geographic Information System database of the Public Roads Network of Hungary. InfoGraph - ÁKMI joint undertaking, 1997
- Geographic Information System for displaying (2D, 3D), managing and analysing geodetic data generated in connection with LRI switching to the WGS-84 system. Customer: Air Traffic and Airports Directorate (Légiforgalmi és Repülőtéri Igazgatóság, LRI) - DATAKART Kft., 1997

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Contact persons:

Zoltán Tóth, CEO

Zoltán Tóth (György Szilágyi) GIS executive

György Szilágyi (Zoltán Tóth) marketing executive

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Further information on Internet

MAPPING AGENCY OF THE HUNGARIAN HOME DEFENCE FORCES

Activities

The Mapping Agency of the Hungarian Home Defence Forces is the legal successor of Tóth Ágoston Mapping and Military Geographic Institute of HHDF (MH TÁTI).

- Production of colour and black & white contact aerial photographs, enlargements, rectified photos, photo-maps and photo-maps with cartographic symbols.
- Running of an aerial photo archive. Photogrammetric evaluation of images.
- Processing of satellite images.
- Map revision using aerial photographs and other base materials, with field reconnaissance. Fair draft of sheets by scribing.

- Geodetic surveying of objects, processing of measurement results. Signalisation of control points and determination of their co-ordinates.
- Compilation and fair draft of tourist, city and road maps and other special maps.
- Plotting of grids and points by means of GIS.
- Fast reproduction of black & white and colour maps and other graphical materials.
- Colour-separation of colour photographs.
- Photographic, photocopying and word-processing tasks.
- Relief model building, production of relief maps.
- Reproduction and printing of different mapping and printed products.
- Map folding, of maps, book binding.



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Sándor Sass, GIS executive

Zoltán Kováts, marketing executive

Further information on Internet

ISIS SWISS-HUNGARIAN GIS LTD.



Integrated Spatial Information Systems

ISIS is a Swiss-Hungarian GIS company. The main activities of ISIS are the system engineering: management, development, implementation; data acquisition: database design, building, digitising; consulting; research; education.

Partners and References:

Hungarian Army □ Ministry for Environment and Regional Policy □ National Authority for Nature Conservation □ Ministry of Labour Issues □ Ministry for Environment and Regional Policy □ Ministry of Interior □ University of Eötvös Loránd (Geophysical Dept. Institute of Sociology) □ Hungarian Academy of Sciences Soil-Science and Geo-chemical

Institute □ AGROBER (Agricultural Trust) □ Local government of Törökbálint □ OTP GARANCIA Rt. (Insurance) □ WESTEL 900 GSM □ MOL Rt. (oil industry).

GIS projects

Municipal information system for Törökbálint

The aim of this project was to establish the land registration and cadastral mapping utilities (water, electricity, gas, channels, telephone, cable TV), planning, tax and social tasks at the local government of Törökbálint financed by OMFB. (This project is a reference project of OMFB.)

NATINFO, as a geographical information system for nature conservation

This project targets handling protected objects such as animals, plants, historic and ethnographic memorials in protected areas and national parks. This project started at 1992 and has been being scheduled.

Regarding PHARE that finances this project partly, the strategy plan was made by ISIS for PHARE office in 1993. The detailed system plan was also prepared by ISIS.

The system has three levels: outline (rate: 1:200 000), topographic (1:50 000), cadastral (1:10 000 outside, 1:4000 inside settlements). The outline level is finished. Topographic level is scheduling. The topographic level for Bükk National Park has finished. Cadastral level has not finished yet but there are two areas where this level is complete such as Káli-basin on Balaton Highland and Tihany protected area

Soil information system for Hungary

This information system is the only soil information system that has every soil spot having correct topological structure. More than 4000 soil spots are included and every soil spot has 10 parameters. This system works in National Authority of Nature Conservation and AGROBER Ltd. The GIS database is available on Arc/Info and MapInfo platform on PC and SUN machines.

Labour information system

In the Ministry of Labour Issues and National Labour Center two information systems were installed in order to handle the high unemployment rate in Hungary. The system contains unemployment data from all Hungary, from every local labour office (it is about 180 region).

Decision support system for state administration at Ministry of Interior

This system was developed at the end of 1993. The purpose of this system is to handle data of settlements.

This system is based on the 1:200.000 map of Hungarian Military Cartography Institute. ISIS converted this digital map to topological correct form and matched alphanumeric data of every settlement. It means about 3200 data record and 400 data per record.

The databases consist of the following data groups: several kind of population data, industry, health, shops and markets, infrastructure (water, gas, electricity, channel), unemployment

Further database is included such as data about local governments, lord major and his telephone numbers, addresses. This information system is based on this huge database that is updated quarterly years.

Insurance information system for OTP Garancia Biztosító Rt.

This system basically includes ten PC and MapInfo based work stations with several modules containing agent success factors, customer information, kinds of insurance construction and contracts. Consequently the system is a very powerful tool for risk analysis.

Geographical Information System for WESTEL 900 GSM Rt.

This information system handles electromagnetic field power all over Hungary to identify shadowed areas. The system can read field survey data from GPS (Global Positioning System) units along roads. Recently this database is about 0.5 GB. The applied GIS software is MapInfo.

Integrated Geographical Information System for Ministry for Environment and Regional Policy

This system is based on a MapInfo network all over Hungary. This system was installed for nine national parks, twelve local authorities for environment and six unit at the centre in Budapest. The information system includes nature conservation data, environmental and pollution data. Based on this system every local unit can use all database that ministry collects.

Concession Information System for Hungarian Oil and Gas Industries p. l. c. (MOL Rt.)

This is a decision support system for the top executives of MOL Rt. which helps in cost/benefit analysis of an oil and gas field in question.

The system is based on the ADC WorldMap split into separate target countries and includes hydrocarbon concession fields, wells, outlines and several kinds of oil and gas data. This part of database comes from the PETROCONSULTANT Ltd. (Switzerland) in ARC/Info format *regarding that* Petroworld database uses ArcView. Taking MapInfo abilities into account, a MapInfo-based concession information system is more powerful and easier to use than a system based on ARC/INFO.

There are three levels of the MOL's system:

- outline level (map scale = 1:30 000 000)
- country level (map scale = 1:1 000 000)
- field level (map scale = from 1:200 000 to 1:10 000)

The outline and country level has been finished integrated with Petroworld database and satellite images for several perspective countries. The field level has just started.

The current size of the database is about 4 Gbyte. The system is running on a SUN SPARCstation 20 GIS workstation and file server; PC clients are also connected to the SUN.

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Further information on Internet

L&MARK

Térinformatika

L&Mark is a certified "qualified partner" of Siemens-Nixdorf Informationssysteme AG. L&Mark is the official distributor in Hungary of SICAD/open, the Geographical Information System of Siemens Nixdorf. They make network information systems based on SICAD/open for public utilities, telecommunications companies and on field of regional planning surveying town planning environmental applications land use area intersection. GIS/LIS and relational databases development, software engineering, full customer services are their fields of activity. They are undertaking GIS consulting, project management and supervising.

Year of establishment: 1992

Owner Manager: Dr. Zsolt Lisziewicz
Andrea Lisziewicz

Main Profile: GIS/LIS Development and Consulting
Partnership: SIEMENS NIXDORF Qualified Partner
Number of Employees: 15

Profile

System Delivery

- Delivery of software SICAD/open, SINCAL, Informix, Oracle
- Delivery of hardware SNI, SGI, HP, IBM, SUN
- Installation

Engineer Services

- Training
- Consulting
- Project Management
- SICAD/open Application Development
- Software Development
- System Integration
- System Planning

Special Branches

- Electricity Supply Service Co., Ltd.
- Telecommunication

Quality Insurance

- SICAD/Open ISO 9001 certified since 1994
- SNI PHB -> QM Handbook since 1995
- Introduction of the Quality System at L&MARK Térinformatika in January 1997.
- L&MARK Térinformatika passed the certification audit in May 1997 with success. Their activities – Design and implementation of GIS-based company technical information systems as well as development of application-software – conform the ISO 9001 Standard Certificate requirements.

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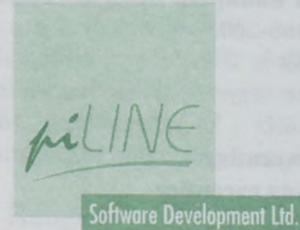
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Gábor Kocsárdi marketing executive

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Further information on Internet

piLINE SOFTWARE DEVELOPMENT Ltd.



With more than 20 years of computer software development experience and 5 years of GIS application development experience Dr. Péter Scaurszki and Pál Rudas founded the company in 1994.

Starting with HUF 10 Million piLINE tripled its turnover every year and became the most dynamically growing GIS company of Hungary. The activity of the company is changing from domestic to export. Their products and services have a continuously growing interest in the East European region and in the United States.

PiLINE is specialising in GIS core software development, GIS application development, data conversion and maintenance of complete GIS solutions for its customers.

Developments include CAD/GIS extensions of existing software and end user applications for large scale WAN and LAN architectures.

Full range of data collection, data preparation, data conversion, and data maintenance service is provided for all the customers requiring complete solutions and also for others who need professional, precise data conversion in the GIS and engineering field.

PiLINE is focusing mainly on the Oil and Gas Industry. Their main product, NYIR (Pipeline Information System) is a complete GIS solution based on Bentley's MicroStation to keep track of all high pressure pipeline-related information, including static and dynamic data.

The first customer was MOL Rt. KTA KFÜ, the Oil and Gas Transportation Branch of the Hungarian Oil and Gas Company. The system was implemented on 8 LANs connected through a nation-wide WAN handling information of 6000 km of high-pressure pipeline of Hungary.

The system is now under implementation in Ukraine for the 30 000 km of high-pressure oil and gas pipelines.

From 1994 onwards the system was shown in three consecutive years at the GIS Conference for the Pipeline Industry

held in Houston, at the GASTECH '95 Exhibition in Kiev, in Prague, Vienna and Amsterdam at GIS shows.

PiLINE works in close co-operation with foreign companies dealing with GIS in the same area. Among them M.J. Harden Associates, USA is specialised to pipeline information management systems. The two companies are working together in the GRI/ISAT standardisation project, which co-ordinates the standardisation efforts in the O&G industry.

PiLINE – as an experienced software developer – is a strategic partner of Bentley Systems Inc. and develops core applications for the Bentley's GIS product line.

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László Nagy GIS executive

Pál Rudas marketing executive

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RUDAS & KARIG

Software Development and Consulting Ltd.

Rudas & Karig

Számítástechnikai Kereskedelmi és Szolgáltató Kft.

Rudas & Karig Private Business Partnership was founded on 1 January 1989. As a result of its successful operation the company grew beyond the limits of a private business partnership, and the Rudas & Karig Software Development and Consulting Ltd. was established with continuity of right in October 1990. On 1 December 1994 the name-giving co-founder Pál Rudas left the company, and his ownership stake was partially bought by Miklós Hidvégi, one of the founding members of the company.

Even since its foundation, the company profile has been designing and developing geographical information systems, designing and building spatial databases and digitizing.

Currently there are 11 graduate software developers working at the company, a ten-strong team performs the digitizing, and we employ 15-20 regular external staff for database filling. Concerning regular external staff we employ not only programmers, but graphic artists, cartographers and surveyors. We concluded skeleton agreements with several companies for undertaking large and integrated projects.

The company is one of the co-founders of polyGIS Térinformatikai Társulás Ltd. which was established in 1994. Rudas & Karig Ltd. has had a 75% ownership stake in this company since July 1995.

Our returns have been growing by 40-70% for many years. The returns of our main activity were 36 million HUF in

1995 and 50 million HUF in 1996. Our export returns have been rising for many years; we produce geographical information systems and digitize mainly for the German market.

We have gained good practice and great experience in the use of several geographical information systems (e.g. MicroStation, Arc/Info). Working applications prove our ability to develop high quality systems.

1989 – 1990, The Beginning

The Rudas & Karig Private Business Partnership is founded. The founders determine the company profile as designing and developing of geographical information systems, creating spatial databases and filling up them, and digitizing. As subcontractor we do the designing and programming of the geographical information systems for the two biggest Hungarian public utility companies. Continuous, successful working relations with Budapest Waterworks come into existence and it still goes on. The Rudas & Karig Software Development and Consulting Ltd. is established.

1991-1992, MicroStation Development

We immerse in the science of GIS more and more. We make use of ten-year-long knowledge of computing. We work hard for the attainment of development in MicroStation environment and we use it up to this time. Standard MicroStation MDL development tools have evolved. Through the continuous updating of these tools, now high-class automated, efficient system development is possible.

1993, Windows Development – The Beginning of Export

On behalf of Markt und Technik GmbH. we begin the development of popular geographical information multimedia systems, which have a very wide circulation. The co-operation has been fruitful up to this time. A Windows based geographical information library comes into being, which take full advantage of most recent technology (DDE, OLE, ODBC, and multimedia); we use it for several system developments. We participate in national and international exhibitions and conferences with success.

1994, Starting Up The Development for Local Government and Digitizing Line of Business

The development of an integrated modular geographical information system for local governments starts up forcefully. We begin a new line of business through digitizing cadastral maps and maps for public utilities. The company is a founder of polyGIS Térinformatikai Társulás Ltd., whose goal is the completion of complex projects. One of the company's name-giving founders, Pál Rudas leaves the company, and his portion of property is partially bought by Miklós Hidvégi.

1995, Dynamic Evolution

This year is the most successful period for the company because of winning and successfully undertaking several large volume tenders. We break in new fields; we start geographical information system developments for tourism and nature conservation. Our contacts increase with a new German partner; our export returns reach 25%. The importance of the digitizing line of business grows with undiminished energy,

its returns exceed 30%. We conclude important professional agreements with Oracle, Microsoft and Bentley.

1996, The Year of Vigor, General Spreading of GIS

We strengthen our position in the acquired fields; our net returns are 50 million HUF. We move in a larger, more attractive and comfortable office. This serves not only for the convenience of our staff, but for the better service of our clients. We have 11 graduate software developers working within the company, a ten-strong professional team performs the digitizing, and we employ 15-20 regular external staff for occasional tasks. We build up regular working relations with graphic artists, cartographers and surveyors.

1997, The Present

Stewart keep working hard to serve our customer interests better.

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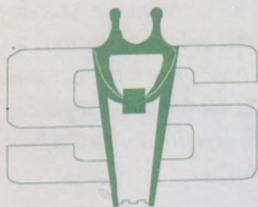
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STEWART INFORMATION HUNGARY LTD.



Sanctity of Contract

Stewart Information Hungary (SIH) is a subsidiary of Stewart Information Services Corporation. SISCO is an U.S. based holding company those co-ordinates business activities of more than 150 enterprises world-wide. SISCO's main businesses are:

Title insurance (Stewart Title Guarantee companies - STG)

Real estate information (Landata Group)

Both Landata Group and STG are a group of companies within the Stewart organisation. Stewart Information Hungary belongs to the Landata Group.

About SISCO's international activities:

Title Insurance:

Stewart issues title insurance policies through over 3,000 locations on homes and other real property located in all 50 states of the USA, and District of Columbia, Canada, Mexico, Belize (reinsurance), Guam, Bahamas, Commonwealth of the Northern Marinas, United Kingdom.

Real Estate Information:

Besides title insurance Stewart companies provide a wide range of information technology (IT) services. This includes aerial photography, photogrammetry, digital mapping and geographical information system (GIS) development. A few example for our IT products:

LANDSCAN: office imaging system for the county clerks.

RE-Source: this product is a state of the art property information database and querying system. It combines three sources of data: 1) County Appraisal Districts real property records; 2) deed record information obtained from the county clerks to provide the most current ownership and mortgage information; and 3) sales information for statistical purposes. GIS based land taxation system for Trinidad.

SISCO in Europe:

United Kingdom: title insurance.

Moldova: participation in a USAID project that targets the establishment of the national land registration system.

Slovak Republic: development of a GIS for local governments for establishing or optimising local taxation.

Activities in Hungary

Stewart Information Hungary has three business lines: software application development (including GIS), information technology (IT) consulting and data warehousing.

Software Applications and Services:

We develop off-the-shelf solutions for local governments and farmers.

Our real property inventory product called Cygnus provides an affordable and easy to use tool for the asset management department of local Governments. Cygnus has a desktop GIS extension.

Another GIS related product of SIH is, in fact, a service package that is called Agrícola. This service package includes classic land surveying, digital map preparation, title auditing and building a farm management GIS.

IT Consulting:

Stewart Information provides our partners with a wide range of IT related services. The spectrum of these services ranges from needs assessment through system design to project auditing.

Data Warehousing:

Stewart Information developed a comprehensive social-statistical database in co-operation with the Technical University of Budapest, Department of Sociology. This database -together with the GIS based querying and browsing tools- supports such complex analyses that have never been possible before.

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HUNGIS FOUNDATION

THE aim of HUNGIS' is to support GIS education, organise workshops, professional demonstrations and offers stipends to students interested in GIS-oriented research.. HUNGIS was one of the organisers of the GIS/LIS Central Europe Conference, the most important international GIS conference and exhibition in the region. HUNGIS publishes its journal on GIS 7 times a year.

BONAVENTURA GIS MARKET ANALYSIS AND PUBLIC RELATIONS OFFICE

BONAVENTURA collects the data of Hungarian GIS market, takes a reliable market analysis of this field and makes a high-level public relations activity. Bonaventura works in close connection with HUNGIS Foundation and HUNAGI. The experts of Bonaventura edit the Hungarian GIS magazine, called *Térinformatika*, prepare Hungarian GIS Sourcebook and different studies every years.

HUNAGI

Hungarian Association for Geo-Information

Members:

Agricultural Science Faculty, University of Agricultural Sciences at Debrecen, AM/FM-GIS Hungary, College on Surveying and Land Management, Sopron University, Hungarian Academic and Research Network Association (HUNGARNET Association), Hungarian Geographical Society, Hungarian Society for Regional Planning and Renovation, Hungarian Society of Surveying, Mapping and Remote Sensing, Hungarian Space Office, Hungarian Urbanistical Society, HUNGIS Foundation, John v. Neumann Society for Computing Sciences, Mapping Agency of the Hungarian Home Defence Forces, Union of the Hungarian Public Administration Informatics, Applicants to be accepted by the 1997 General Assembly: Dennis Gabor Foundation, Prime Minister's Bureau Co-ordination Office for Informatics, Department of Physical Geography, József Attila University of Sciences, Institute of Geodesy, Cartography and Remote Sensing, Geological Institute of Hungary, Department of Photogrammetry - Budapest Technical University. Potential New Members in 1997: Plant Health and Soil Protection Service, UNEP GRID Budapest

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HUNAGI - the Hungarian Association for Geo-Information has held its inaugural meeting on 9th November 1994. Since then it gained full member status in the European Umbrella Organisation for Geographical Information (EUROGI) and according to its mission objectives, it plays active role in forging institutional links between European organisations, institutions and the Hungarian GI community. HUNAGI has effectively supported the series of conferences and exhibitions called GIS/LIS'9x Central Europe and arranged HUNAGI Forums chaired and lectured by invited prominent experts of the European and US spatial data infrastructure. Meantime, HUNAGI was invited by GISIG to take part in the WELL-GIS Project in the Copernicus Programme, to assist in the formulation of the GI2000 Programme of the European Commission orchestrated by the DG XIII E-2 and to demonstrate the GI-related progress in Hungary at the Joint European GI Conferences held in the Hague, Barcelona and Vienna. Based on the emerging relations with the JRC, Ispra and the DG III.

HUNAGI was granted the right to host the 4th European Commission GIS Workshop in Budapest, 24-26 June, 1998. HUNAGI disseminates regularly news on the European connections in leading GIS periodica. The Hungarian Geographic Information Infrastructure is under intensive development, where HUNAGI's expertise and links supports the harmonisation with European and Global initiatives. The operation of HUNAGI as NGIA is heavily supported by the Department of Lands and Mapping of the Ministry of Agriculture, the National Committee for Technological Development (OMFB), and the HUNGIS Foundation providing basic office infrastructure and mobility.

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