

Geodata warehousing

For organisations grappling with managing large volumes of evergrowing geo-enabled data, developing a geodata warehouse can be an ideal solution, as it improves the availability, usability and reliability of geodata within the organisation, say **Joachim Figura** and **Kenneth Clifford**

across all the organisations, by enabling better data access and sharing. All of the following data warehouse implementations are real projects with true benefits, accomplished with reasonable budget, low risk and are highly scalable across all departments and related agencies.

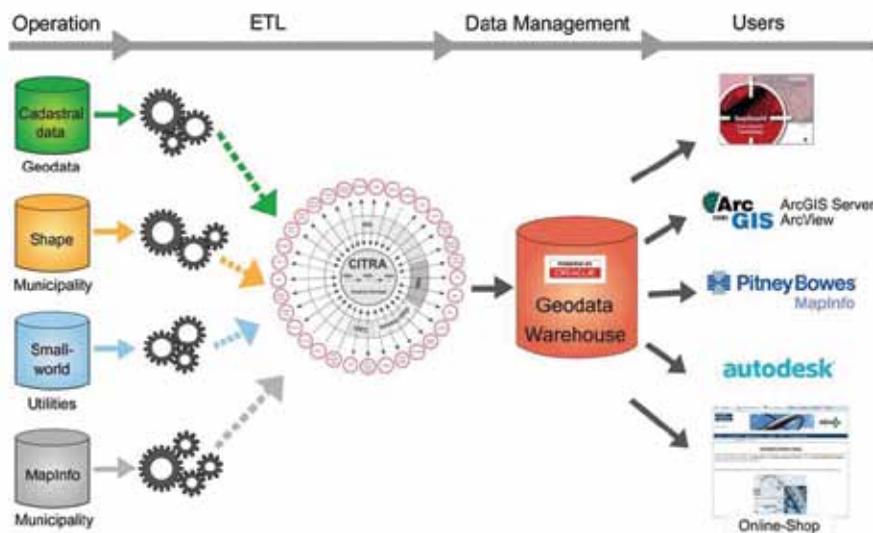
Developing a geodata warehouse for the Herten Group

The GIS project in the Herten Group was influenced by its complex organisational structure: Hertener Stadtwerke GmbH as local utility, city of Herten and Zentraler Baubetriebshof (dep. of civil engineering, traffic, transport...) all of which impact geodata infrastructure. Due to the constant growth in geodata generated and the difficulties faced in meeting the information needs of the staff across the different departments, reorganisation of the management of geodata at the Herten Group was absolutely essential. In addition, there was also a requirement to supply geodata to external service providers and agencies.

The growing use of databases like Oracle Spatial that allow spatial queries, have paved the way for the introduction of spatially enabled data warehousing technology across enterprises

A modern, state-of-the-art IT infrastructure was required to provide services and the supply of geo-information. It was decided that the implementation of a classical geodata warehouse supplemented with geodata content was the best solution.

The introduction of the geodata warehouse in Herten took place incrementally in several steps, and was accomplished without any technical difficulty. This phased implementation was not a radical change, and the project was implemented according to the priority of subtasks and was accomplished with marginal organisational, technical and financial risks. Additionally, the ETL-product CITRA ensured smart and problem-free step-by-step improvements for future enhancements. With the implementation of the geodata warehouse, all geodata and interrelated attributive alphanumeric data from the different sources are accessible to all departments of the entire Herten Group, neighbouring municipalities and external private users or commercial



Geodata Warehouse in Herten

as professional platforms and tools of choice. Prior to the implementation of CITRA and Oracle, the geodata and alphanumeric data with a spatial reference were stored in different file systems and databases, e.g. cadastral data, real properties registry, land development, building blocs, road construction, dumpsite, micro sewerage plants, sewer, natural monuments etc. The data was stored in Oracle, DB/2 and in Access databases and in different file systems, e.g. CAD-data in DXF/DWG files.

A consistent and centralised process for management of the consolidated data was a core requirement. After a detailed development of a proof of concept, a geodata warehouse was implemented based on Oracle Locator as part of the Standard Edition – one utilising the already available CITRA licenses. The licenses were extended to serve as ETL-tool to and from Oracle. Presently data sets like cadastre (ALKIS), official topographical data (ATKIS), building blocs, sewer, environmental data and other environmental state data are managed in the geodata warehouse and provide data and services for the users of the administration of the counties and municipalities.

The following systems are currently in use: MapInfo Professional as a standard inquiry system, Grappa Online based on MapXtreme as the geoweb component. The warehouse was implemented based on the OGC-Simple Feature Standards. This implementation facilitates direct access from all systems which are OGC-Simple Feature compliant. Additionally, it is important to note that the database contains

providers. The Herten Group now uses different GIS platforms: Smallworld GIS, ArcView and ArcGIS Server, MapInfo Professional and Grappa Online based on MapXtreme from Pitney Bowes and Graphservice as well as AutoCAD.

All OGC-Simple Feature compliant GIS have direct access to the required data so that all data can be used easily by the different departments. The following data is made available in the form of a combined, compatible and consistent data stock: cadastral data, topographical data, utility data such as electric power, gas, district heating, sewage, traffic, transport, environment and many more. Additionally raster data and imagery (aerial, satellite) in the warehouse is accessible by using WMS. All data from the land registry office of Recklinghausen is transmitted as daily updates to the database. Oracle Standard Edition1 with Oracle Locator is used as the core technological basis of the geodata warehouse and CITRA is used as ETL tool.

A direct OGC-Simple Feature conform access for the GIS-systems Smallworld GIS, MapInfo, MapXtreme and ArcGIS Server has been already realised for the essential data. To simplify the downloading of datasets for local processing, the CITRA-ExportCentre has been implemented. Customised Web services are implemented as well.

KDZ gets a geodata warehouse

The KDZ is the Municipal Data Processing Center for the counties of Olpe and Siegen-Wittgenstein in Germany. KDZ presently covers 18 cities and municipalities with over 460,000 inhabitants in two counties. The coverage area is 60 km from north to south and 55 km from east to west. Managing the growing repositories of data had become a daunting task for the centre that was looking for a technology solution to streamline its data management and sharing process. When the geo-enabled data warehousing project was initiated at KDZ, CITRA and Oracle were chosen

Each data warehouse development scenario is different, but the underlying principles are the same – most importantly, the warehouse should be serviceable in any environment

the complete presentation of the data to allow usage without any specific application.

After the implementation of the geodata warehouse, the city of Olpe decided to introduce MapInfo Professional for managing the everyday GIS-inquiries, Intergraph's Geomedia with specific applications for urban land use planning and road construction. The access from Geomedia was directly possible without additional project work. Olpe is very satisfied and pleased with the availability, performance and presentation of the data.

The city of Netphen uses the Stadtcad Hippodamus application for urban planning based on Autodesk Map. The access to the warehouse using CITRA and Autodesk's FDO technology is successfully implemented and used throughout the city. CISS TDI's Shop application "geoCommerce: The Shop" was also implemented. The "Shop" application allows authorised users to automatically extract data from the warehouse for different applications and formats for local use via the Web server.

State Capital of Duesseldorf improves data access

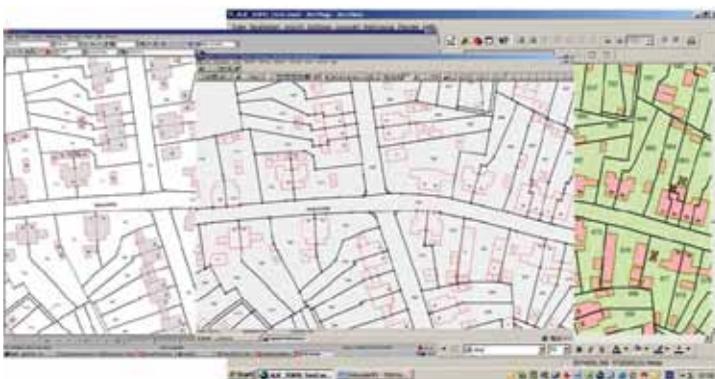
The state capital of Duesseldorf has been using MapInfo Professional as a centralised GIS for several years. Over the years, a huge amount of geodata has been collected from departments of the city; this data is combined for broad use across the city and related agencies. The primary goal is to provide the cadastral data derived from an old IBM-GFIS installation, and other data to all departments and agencies in a consolidated form using the latest technologies. To accomplish these goals, the state capital decided to use an Oracle and CITRA based solution.

CISS TDI developed a geodata warehouse solution for the City of Duesseldorf with important features like parallel access with different GIS technologies utilising CITRA as ETL tool. Data from the different departments has been successfully translated from the source format to the CITRA format. The strong CITRA modelling tools were used to transform the data according to the requirements of the target data model in the Oracle database. Then CITRA was used to load the data into the database Oracle Locator. Users

With the implementation of the geodata warehouse, all geodata and interrelated attributive alphanumeric data from the different sources are accessible to all departments of the entire Herten Group, neighbouring municipalities and external private users or commercial providers

can now directly access the data with MapInfo Professional, MapXtreme and also with Intergraph's Geomedia. In future, GE-Smallworld and other platforms used in Duesseldorf can be accommodated without further conversion. The database is designed for future requirements to manage further demands of data exchange between the departments. Further data imports and exports can be easily managed using new formats and as yet unknown data models. The implementation now has been operating successfully for several years.

With the introduction of the new official German cadastral data model ALKIS, a new requirement arose to provide ALKIS data beyond the cadastral agency in a suitable data model in the Oracle-based data warehouse. Besides the existing data stock, the ALKIS data can be directly accessed by all departments and applications by the various GIS platforms. Using the NAS to CITRA translator (NAS is the official ALKIS exchange format) and the associated configuration, the data is translated according to the official ALKIS standards into the database. The NAS to CITRA translator, processing about 180.000 rules, provides qualitatively high class results, with respect to a GIS suitable data model, especially regarding the topology and the graphical and alphanumeric representation. Officially required presentations for GIS objects, which are published in the comprehensive documentation of the GeoInfoDok, and based on complex rules for the presentation, have been implemented. All object types included in the ALKIS object type catalogues are supported.



Herten: Direct Access on Oracle from ArcGIS, Smallworld, MapInfo

Conclusion

The goal of improving the availability, usability and reliability of geodata within the three organisations have been met or even exceeded. The common and regulated use of data has been improved substantially, without the need to change the GI infrastructure. Up-to-date data in the geodata warehouse allow decisions on a far more reliable basis than in the past.

Efforts and costs regarding the data translation process were drastically reduced due to consolidated and standardised processes. The investment was comparatively low and it had many benefits. Additionally, the step-by-step expandability,

driven by the requirements of the users, is a clear advantage of this approach. With the experience of 20 years in the field, CISS TDI helped organisations to effectively implement the geodata warehouse.

About CISS TDI

CISS TDI was established in 1982 as a software company specialising in geoinformation with the objective of providing the access to geodata for a broad user group. CISS provides CITRA as ETL-Tool, geodata warehouses and shop solutions based on Oracle geodata solutions.

ETL-Tool CITRA

A key issue as presented in the above mentioned case studies

CITRA has proven to provide very high value within each department across all the organisations, by enabling better data access and sharing

is the handling of complex data modelling by utilising CITRA ETL tools, which is the primary practice. CITRA is a sophisticated software solution, well tested, used extensively, and having been under development with constant enhancement since 1987. Quality assurance and data modelling are its important components. CITRA is widely spread with more than 5,000 licenses in Germany. 

Joachim Figura & Kenneth Clifford
CISS TDI

Overwatch appoints Skip Maselli as Vice President of Geospatial Solutions



Geospatial Solutions. In this role Maselli is responsible for the overall management and growth of Overwatch's geospatial products, services and solutions, including business

development, sales, strategic planning, operations and technology development. He reports to Don Hairston, Textron Systems Advanced Systems senior vice president and general manager.

"Skip is an accomplished

leader, strategist and manager who brings to the Overwatch team more than 23 years of experience in the areas of integrated intelligence, remote sensing, image processing and geospatial intelligence," said Hairston. "On top of that he has in-depth knowledge of and relationships with the NSG (National System for Geospatial Intelligence) community, and understands how to meet GeoINT, commercial satellite and airborne imagery, and mapping requirements of the Department of Defense, as well as federal, state and local government customers."

Prior to joining Overwatch, Maselli was director, GEOINT strategy and mission

architecture at Northrop Grumman Information Systems, Intelligence Systems Division. He also held management and leadership positions with EarthData International, InfoTech Enterprises and MRJ Technology Solutions. Before that, Maselli served for more than seven years in the US Army as an imagery intelligence officer, instructor, and research and development scientist.

Maselli earned a Master's degree in remote sensing and image processing (civil and environmental engineering) from the University of Wisconsin and a Bachelor's degree in geology and philosophy from Dickinson College, Carlisle, Pa.

Overwatch, a strategic business of Textron Systems Advanced Systems, an operating unit of Textron Systems, a Textron Inc. company, announced that it has named Skip (Arthur) Maselli as Vice President of