



**“GIT UR DUN”!
COST EFFECTIVE MODELLING AND MIGRATION BETWEEN PLATFORMS
KENNETH R. CLIFFORD P.ENG., C.L.S.
JOE FIGURA, CEO
CISS TDI / CISS AMERICAS
6415 - FM 541, MCCOY, TEXAS, 78113**

Paper details three operating scenarios where CITRA from CISS has been utilized to overcome the pitfalls, restrictions and high cost of moving to a new GIS environment and/or accommodating multiple existing platforms.

In the three successfully implemented scenarios the solutions are across multiple platforms including: Smallworld, Intergraph, ESRI, Autodesk, MapInfo, Oracle, and other less known GIS solutions. Each scenario demonstrates a different client environment, yet across multiple departments and agencies both internal and external such as: utilities (gas, electric, water), planning, regulatory, transportation, distribution, cadastral, finance and a wide variety of other departments. Implementations described accommodate diverse data formats and elements in a centralized geodata Warehouse environment, based on an Oracle open environment. Implementation is facilitated by CISS- CITRA ETL tools and CISS professional services.

Each scenario is different but the underlying principles are the same. Most importantly what we detail here is serviceable in any environment. The Scenarios presented were selected from a very wide and deep project experience gained from implementations over the past twenty years. CITRA has proven to provide very high value within each department/user across all the organizations, as corporate wide every user has ready access to all the data available.

The German environment is one of the most demanding globally, requiring sophisticated applications, based on highly complex requirements, driven by a high level of data modeling, Quality Assurance, Migration, Translation and Enhanced Data. Made in Germany is a brand standing for precision and high quality in N.A. This is the same in the GIS and data management environments. What is being done in Germany now will serve well in the present and future requirements in the North American Data Management and GIS environment. CISS and the CITRA tools are foundational in the Germany territory for Data Modeling, Migration and Translation; presently there are in excess of 5,000 licenses in the German market alone. Expansion has developed globally in Brazil, Ireland, Turkey, and Saudi Arabia.

Strategy varies, however the basis is a low risk, cost effective, staged implementation with minimal impact and cost to develop the centralized data warehouse. CITRA facilitates direct access to all the data in the warehouse no matter what the GIS or other platform past, present or future, in a format and view that is chosen by the end user that best fits their needs.

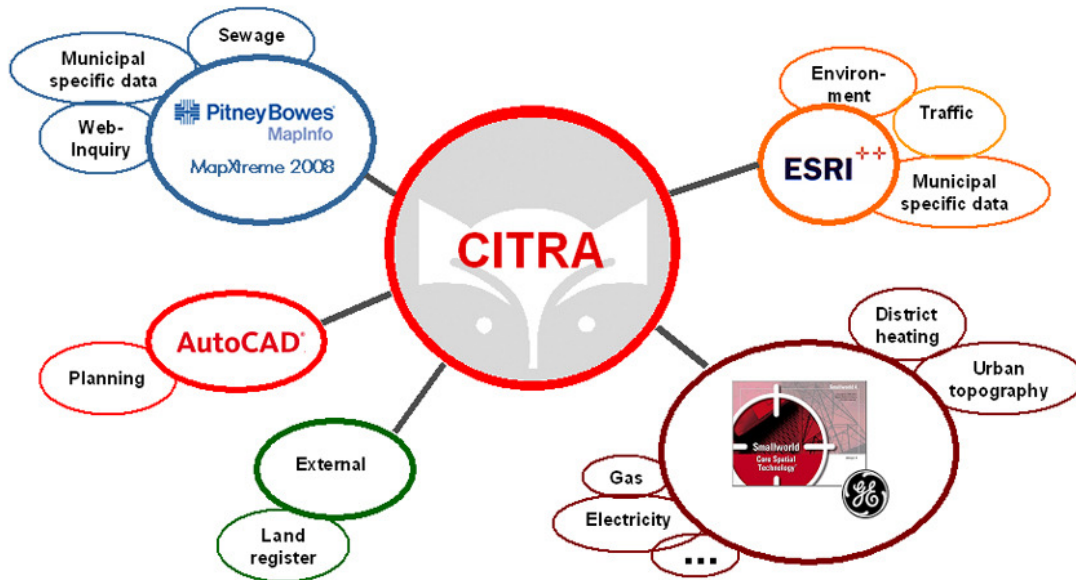


Figure 2: Initial Situation in Herten, Exchange with CITRA

The introduction of the geodata warehouse in Herten took place incrementally in several steps. This was accomplished without any technical difficulty and is preferred to an all-at-once data migration. This phased implementation was not a radical change, and the project was implemented according to the priority of subtasks and results with marginal organizational, technical and financial risks. Additionally CITRA demonstrates 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 is accessible to all departments of the entire Herten group and neighbouring municipalities and external private users or commercial providers as required. The Herten group decided to use several different GIS platforms after the consolidation of the GIS infrastructure and the implementation of the geodata warehouse, e.g. Smallworld GIS, ArcView and ArcGIS Server, Mapinfo Professional and Grappa Online based on MapXtreme from Pitney Bowes Mapinfo and Graphservice as well as AutoCAD. All OGC-SFO 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, CITRA is used as ETL tool.

At the beginning of 1990 CITRA was implemented at the city of Herten as well as at the Hertener Stadtwerke GmbH and was successfully used for many complex tasks in a homogeneous concept. To set up the geodata warehouse only a license upgrade for the module CITRA-Oracle was necessary.



A direct OGC-SFO conform access for the GI-systems Smallworld GIS, MapInfo, MapXtreme and ArcGIS Server is already realized for the essential data like cadastral data, topographical data and utility data from Hertener Stadtwerke. As required more data is accessible.

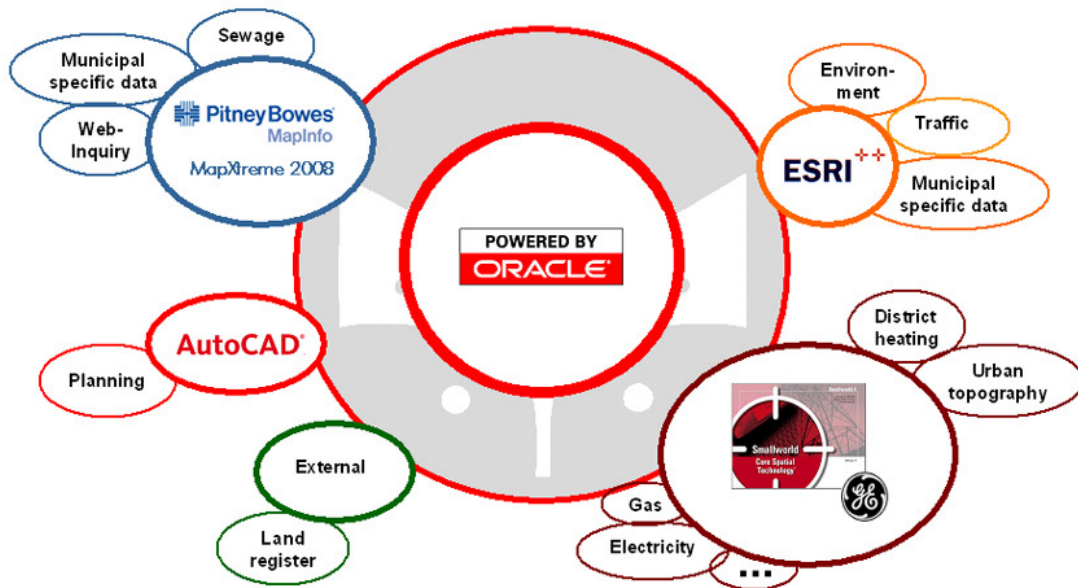


Figure 3: Actual Situation in Herten, Direct Access to the Involved Systems enabled by the ETL tool CITRA

To simplify the download of datasets for local processing, the CITRA Export Centre has been implemented. Customized web services are implemented as well.

Replacement of ALK by ALKIS (the new German complex cadastral data-model) is already included in the concept of the geodata warehouse. The development of the ALKIS-Oracle interface and its configuration is already developed and assures the usage of any ALKIS data in the data warehouse. In addition to the concise and attractive data model, CISS TDI sets a high value on compliance to the official ALKIS standards as stated in the latest GeoInfoDok. As a consequence it is now possible to have direct access to the ALKIS data by any SFO-conform GI system within the Herten group and to have an appropriate presentation of the data without need of further applications or tools.

STATE CAPITAL OF DUESSELDORF

The state capital of Duesseldorf has been using MapInfo Professional as a centralized Geo-Information-System (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 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 has implemented a geodata server/geodata warehouse prototype for the City of Duesseldorf. The prototype was a proof of concept of the implementation of a geodata server with



its important features, e.g. parallel access with different GIS-technologies. CITRA is the ETL(extract-Translate- Load) 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 prepare 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 can now directly access the data with MapInfo Professional and MapXtreme, Intergraph's Geomedia and GE-Smallworld, in the future other platforms 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 is now in production and has been successfully operating 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. Beside the existing data stock the ALKIS data can be accessed at this point as a prototype over-all departments and applications by the various GIS platforms. Using the NAS (ALKIS exchange format) to CITRA translator and the associated configuration NAS to Oracle from CISS TDI the data is translated according to the official ALKIS standards into the database. The translator NAS to CITRA provides qualitatively high class results, e.g. in the graphical representation. Officially required presentations of the GIS-objects, which is published in the comprehensive documentation of the GeoInfoDok, and based on complex rules for the presentation of e.g. building symbols, labelling rules etc., have been implemented. Alphanumeric data like object numbers, keys and additional text is processed and migrated. All object types included in the ALKIS (over 180,000 rules) object type catalogues are supported and the official code tables are used for presentation in plain text or placement of symbols such as building use or classification. During the translation, process codes from the tables are used to pull the content from other sources into the data model as well as text placement for presentation (graphics). As an example, code 2056 represents "Pharmacy", code 3051 represents "Hospital", in the NAS dataset only the numeric codes are included, however in the Oracle database both numeric and alphanumeric are included. For presentation purposes such as on the screen or printed documents the text is used i.e. "Pharmacy".

MUNICIPAL DATA PROCESSING CENTER SIEGEN (KDZ WESTFALEN SUED SIEGEN)

The KDZ is the Municipal Data Processing Center for the counties of Olpe and Siegen-Wittgenstein. This implementation presently covers eighteen 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.

With the implementation of a high capacity radio line network in 2004 the geodata infrastructure required state of the art Technology and thus CITRA and Oracle were chosen as the 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 as mentioned in file systems e.g. CAD-data in DXF/DWG files.

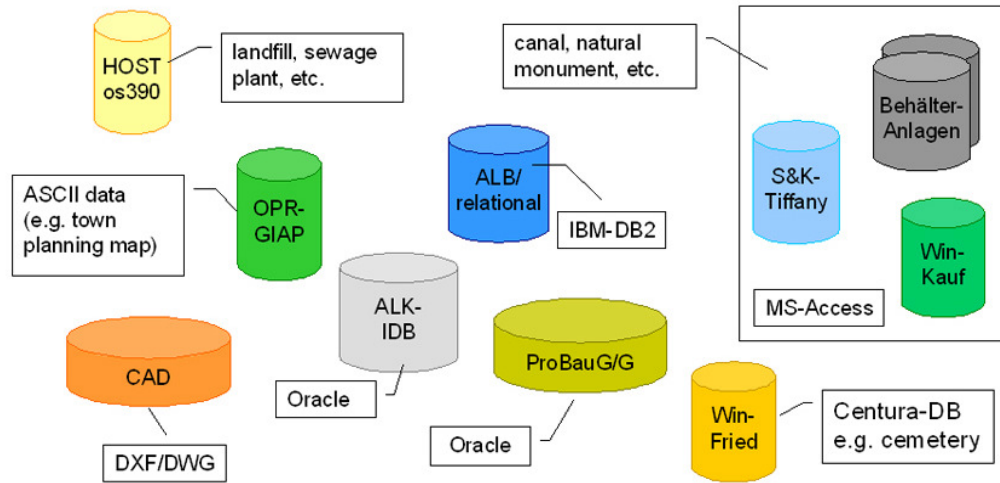


Figure 4: Initial Situation at KDZ-Westfalen Sued Siegen

A consistent and central data management of the consolidated data was a core requirement. After a detailed development of a proof of concept a geodata warehouse was implemented using CITRA based on Oracle Locator as part of the Standard Edition one. The CITRA-licenses were extended to serve as ETL-tool to and from Oracle. CITRA was previously and is still used as a translation tool to convert cadastral data according to the official and sophisticated presentation rules, called ZV-Aut, from EDBS to MapInfo Professional. This procedure was a requirement of the responsible regional government of Arnsberg. Presently data sets like cadastre (ALK/ALB), 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 formats are manipulated in the CITRA based ETL-processes: Oracle, EDBS/ALK, EDBS/ATKIS, MapInfo TAB, Shape, and DXF. The NAS-Oracle translator was also implemented. The following systems are presently 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-SFO compliant. Additionally it is important to note that the database contains the complete presentation of the data to allow usage without any specific application, e.g. the complex ALKIS-data. ALKIS has not been implemented at the time of this writing, however the KDZ has tested the application and is well prepared for future implementation.

After the implementation of the geodata warehouse the city of Olpe decided to introduce the desktop-system MapInfo Professional for everyday GIS-inquiries and the Intergraph system 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 through out the city.

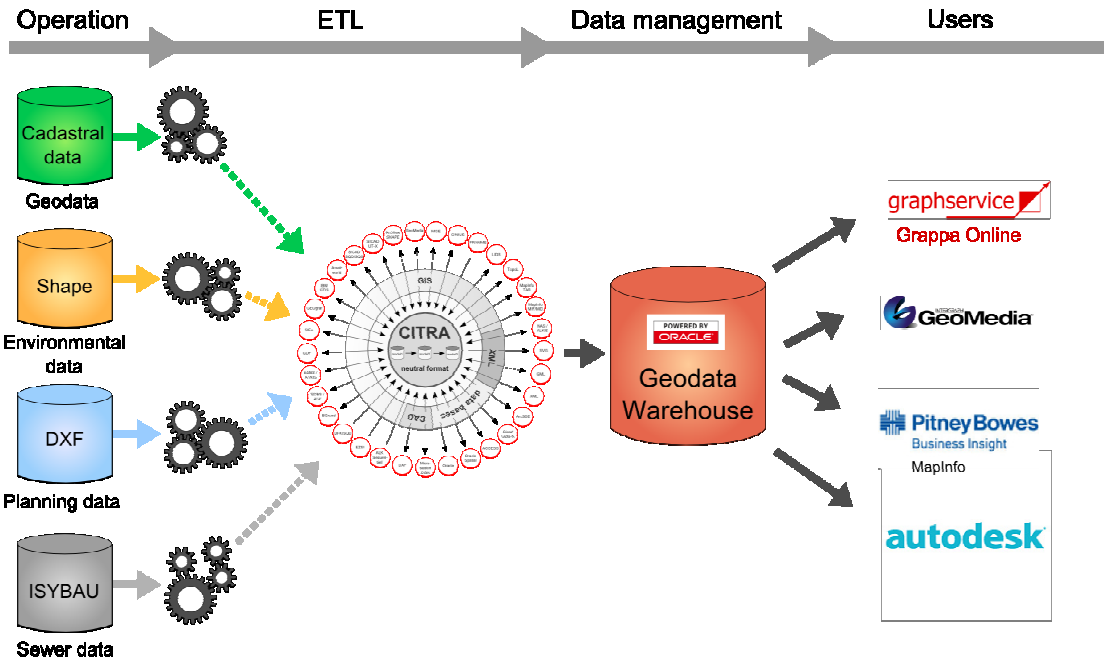


Figure 5: Actual Situation at KDZ-Westfalen Sued Siegen,
Oracle Based Geodata Warehouse

CISS TDI's Shop application "geoCommerce: The Shop" was also implemented. The "Shop" application allows authorized users to automatically extract data from the warehouse for different applications and formats for local use, via the web server.

With the introduction of the new official cadastral data model (ALKIS) the KDZ is required to provide the ALKIS-data beyond the cadastral authorities for the users in the counties and cities in an appropriate data model within the Oracle data warehouse. The NAS-Oracle converter was delivered early in 2008 for evaluation purposes and is now implemented to easily provide the massive and complex ALKIS-data to the customers of the KDZ immediately upon the introduction of ALKIS.

REFERENCES

CISS can provide references for the scenarios or other implementations. Please contact the authors, to discuss your specific needs.

ADDITIONAL CISS IMPLEMENTATION INFORMATION

From the beginning, the CITRA development focus has always been on strong data modelling tools rather than on accommodating formats. The reasoning for this direction is market driven due to the stringent requirements to supply accurate and high quality data to suffocated GIS environments, and complex data models, meeting the exacting standards of a typical German user.

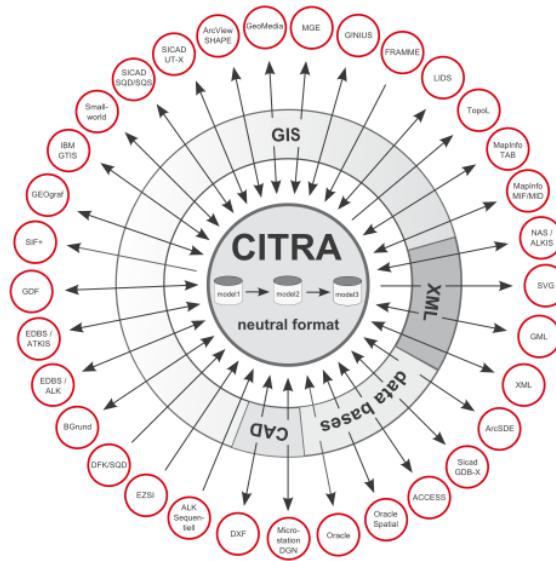


Figure 6: CITRA – The Concept 1 “Hub”

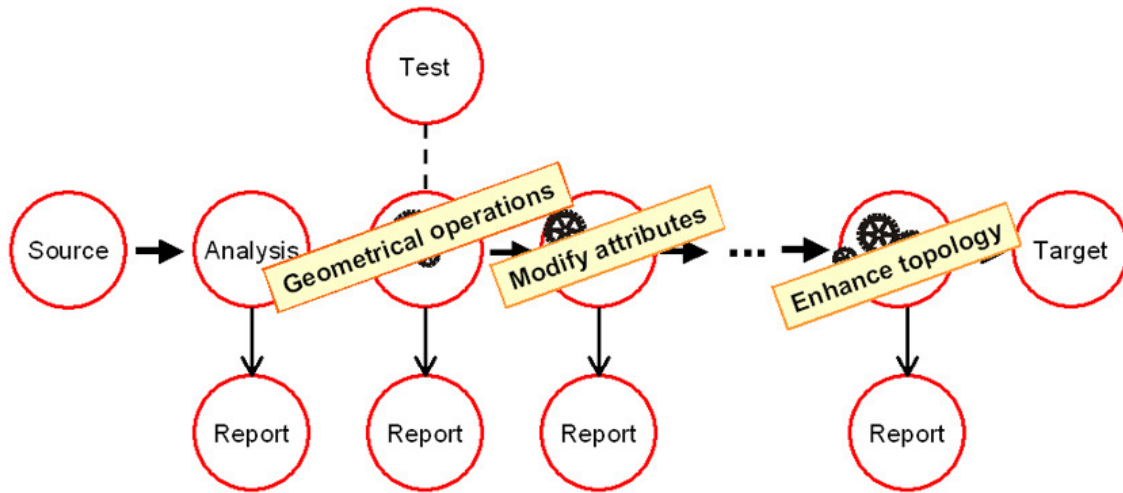


Figure 7: CITRA – The Concept 2 “Inside Data Modeling”

Since the middle of the 90's bidirectional translators between GIS platforms and Oracle Spatial were developed and successfully utilized in several integration and migration projects within the CITRA environment. You can take advantage of this extensive project experience to meet your requirements. CITRA is not an out of the box translator but a highly sophisticated data modelling and migration tool. Working with the CISS professional implementation team and our CITRA tool set assures project success. CITRA, using its Data Modelling and Migration engine provides a high performance, cost effective automated translation from source to target.



Figure 8: 1:1 Translation

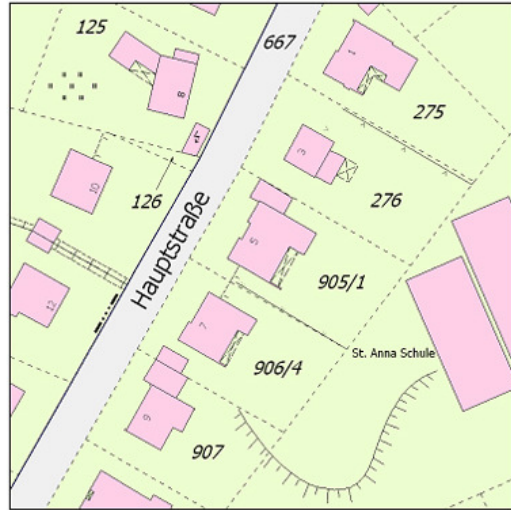


Figure 9: Configuration According to the Presentation Rules "ZV-Aut"