

Cadcorp

PROFILE AND SOFTWARE REVIEW: No. 1

*In this new series GI News will profile leading GIS companies, looking at their background, current situation and future prospects as the GIS software market develops and matures. These profiles, by **Jonathan Raper** of City University, are based on visits to the companies, interviews with key staff and independent evaluations of their software. The first British GIS profile focuses on Cadcorp of Stevenage, Hertfordshire, a small GIS company by global standards, but one of the most rapidly growing.*

Origins and company development

The Computer-aided Development Corporation (Cadcorp) was founded in 1991 to provide 'spatial management systems' for PC users at a time when the Windows operating system platform was only just becoming recognised as sufficiently powerful for GIS applications. While other developers concentrated on Unix in the early 1990s, Cadcorp developed an industrial strength GIS application for Windows called Cadcorp Spatial Information System (SIS), which was first released in 1995. Since Cadcorp entered the GIS market comparatively late, it offers one of the youngest systems on the market. Since the Cadcorp SIS product was originally designed for Windows, it has not been necessary to re-engineer it for Windows from Unix.

Given the competitive nature of the

GIS marketplace, Cadcorp has done very well in developing a respectable share of the market while thriving alongside the (primarily US-based) GIS multinationals. How has the company achieved this? Cadcorp was able to establish itself in the GIS market by delivering one of the earliest desktop GIS products and exploiting its popularity quickly. Since those early years it has focused on specific markets sectors such as local government and ambulance services, and has innovated strongly in data integration and Internet support.

The company has also developed strong reseller partnerships in Central America, Europe and in south-east Asia, in particular in Japan where its reseller Informatix has made Cadcorp a leading supplier. Cadcorp had shipped 7,000 licences by March 2001, and at \$205,882 per head the company claimed one of the highest per-employee revenues in the GI sector for the financial year 1999. The company remains in private ownership with offices in Stevenage, London and Boston, USA.

On a visit to Cadcorp in Stevenage I was met with a young and enthusiastic workforce clearly enjoying what they do. I was loaned a copy of the software (version 5.2) with which I was able to install the Cadcorp SIS desktop products on my work PC, running Windows NT (with a 28 Mb footprint). I was also able to test some of the Cadcorp Internet products that are accessed through the company website.

Product portfolio

Since the release of Cadcorp SIS in 1995 the Cadcorp product portfolio has grown into a complete family of desktop applications, developer kits, web integration tools and database access modules available on Windows 95, 98, NT and 2000. The set of applications is best

summarised through the Cadcorp wheel (see Figure 1). These applications are fully documented in the well written, up-to-date and informative user manual, and there is a suite of training materials that take the user through all the Cadcorp SIS applications. The user manual is published as a book, making for excellent reproduction (though it is a little difficult to use as a manual as it won't lie flat on the desk – a minor gripe).

The Cadcorp SIS Map

Viewer/Manager/Editor and Modeller desktop applications are all built on the same basic foundation. The Map Viewer is essentially a subset of the Map Modeller functionality: opening these applications one after the other simply adds extra menus and options to a standard interface. The Control Development Modules (CDM) are run-time licences corresponding to the various Cadcorp SIS 'Map' applications that allow developers to deploy the functionality in Windows applications developed with Visual Basic or C++. The Software Development Kit provides the development environment for the SIS applications, while the Internet Development Kit allows applications to be built for the delivery of SIS functionality



Mike O'Neil, managing director, Cadcorp



Figure 1: Cadcorp wheel

over an intranet or the Internet using the Active Server Component.

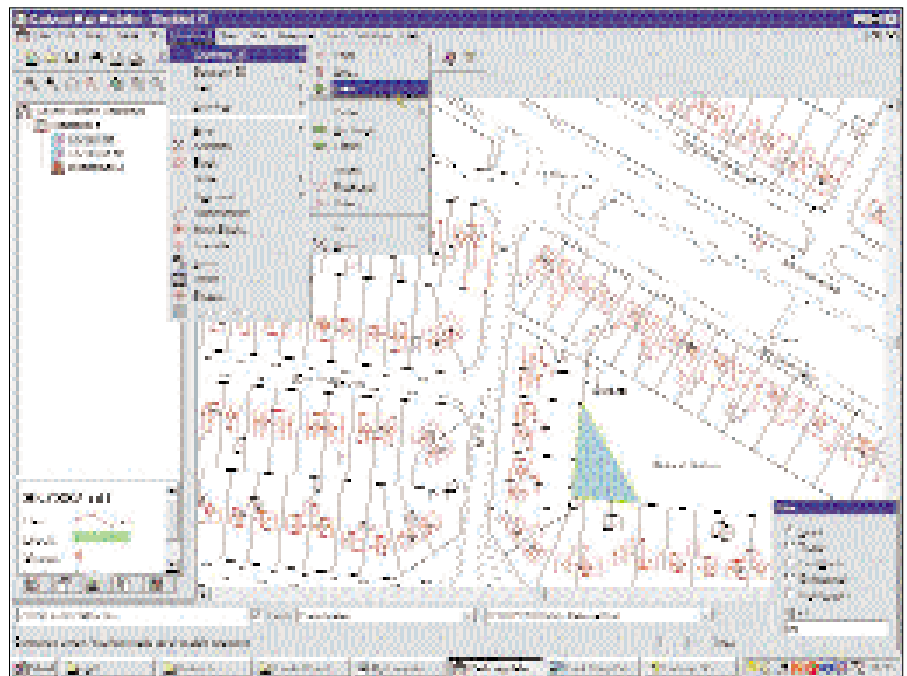
Functionality of Cadcorp SIS

Using the Cadcorp SIS 'Map' applications is quite straightforward if you are familiar with the user interface employed in Microsoft applications, especially in its use of wizards. However, you will need to become familiar with key Cadcorp concepts before you use these applications:

- Geometric data viewed in the map window is referred to as an 'overlay', and can be derived from a source dataset such as a GIS file, image or a binary large object (BLOB) in a database table, which after changes can be saved into Cadcorp's Base Dataset format.
- Each overlay has a 'table' to store attribute data, which has a schema description containing certain default system attributes including an identifier and the x, y and z origins of the overlay.
- Saved Window Definitions (SWDs) are files describing the contents and display properties of the overlays and tables associated with a map window, allowing the session and its properties such as projection and coordinates to be saved into a workspace.
- Themes are analytical presentations of overlays, produced using shading or symbolisation.

The standard user interface for all of these applications consists of a workspace at the left-hand side, with panels corresponding to the document types supported by the application, and a map window on the right. While the Map Viewer application simply opens, displays and makes thematic presentations of existing datasets, the Map Manager allows the user to integrate and compile data collections made up of overlays, tables and themes into SWDs with common projection and coordinates. The Map Manager also allows the user to design, store and execute queries using a wizard. The Cadcorp SIS applications support the import of 45 GIS dataset formats and have especially good support for Ordnance Survey products. Support for GPS formats is still under development, however, and multimedia support is currently limited to georeferenced imagery.

The Map Editor is designed for the manipulation of spatial datasets and supports geometric, topological and database operations. Users can digitise within Map Editor and create topology for simple intersecting geometry on the fly, and topological relations such as turn



Cadcorp SIS features strong tools for data construction and editing.

restrictions can be set. The Map Editor supports a variety of CAD operations for geometric construction and has a trace command to follow lines automatically on background rasters. The Map Modeller adds surface modelling to the functionality of the Cadcorp SIS applications, supporting TIN/grid creation and visualisation and Thiessen polygon mapping. The Map Modeller also supports image rectification by point and click and allows raster manipulation through standard map algebra functions.

Cadcorp SIS – Spatial Information System Requirements

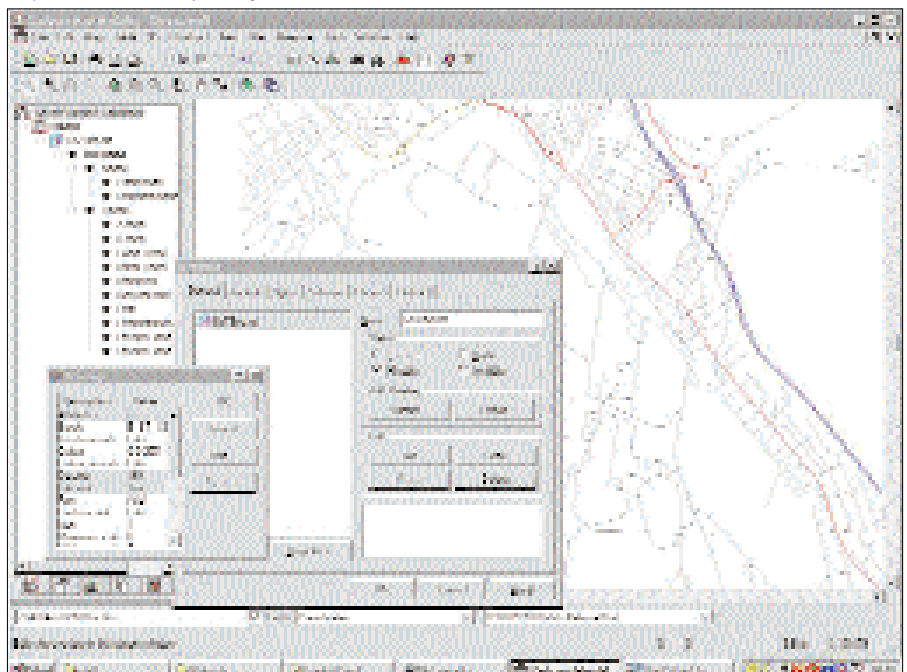
Minimum system requirements

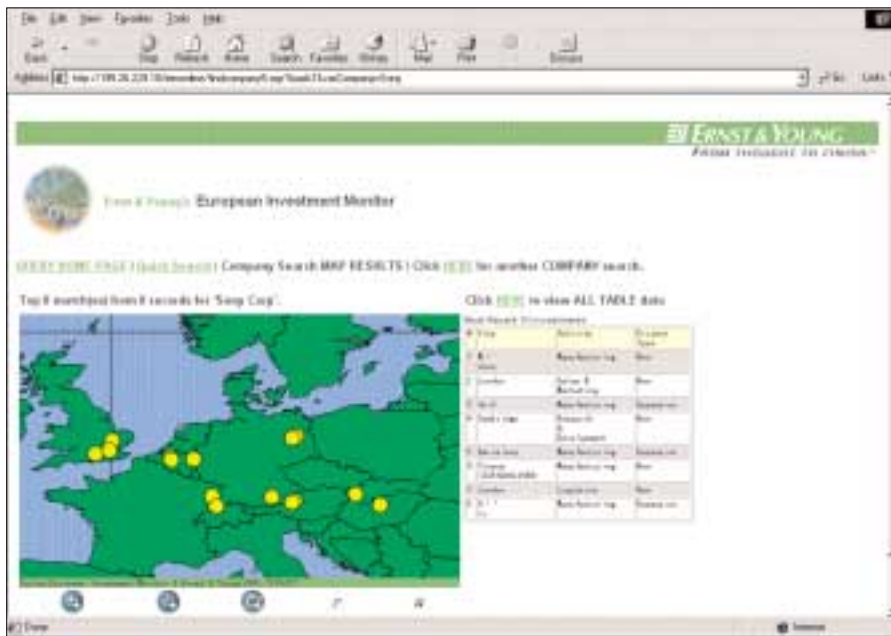
Pentium Processor
Win 95
32 Mb RAM
400 Mb Free Disk Space
Mouse
CD ROM drive

Recommended system requirements

Pentium III Processor
Win NT 4, 98, 2000
128 Mb RAM
1 Gb Free Disk Space
Intellimouse
CD ROM drive

Properties of data are easily interrogated and edited.





Cadcorp SIS ASC powers the Ernst & Young European Investment Monitor

Image © Ernst & Young

ASC product bundled with the Map Modeller that allows the distribution of SWDs across intranets and the web. The Map Server has been developed around the OpenGIS Web Map Overlay specification that has been tested through the Web Mapping Testbed at www.webmapping.org.

Prospects

Cadcorp has established itself as a technically highly innovative niche player in the GIS market, with an easy-to-use set of products that live comfortably alongside the major GIS systems and databases. The company's strategy is to develop for the Microsoft operating system platform while actively participating in, supporting (and guiding) industry collaboration and open standards within the OpenGIS Consortium. As a private company with a growing international user base, the company has control over its own destiny and is thriving on the competition both at home and abroad.

Are there any clouds on the horizon for Cadcorp? Its growth potential is perhaps limited if the GIS multinationals increase their market share, since systems with a smaller user base often find it harder to sell into corporations. Several technical developments on the horizon will also test its development resources, such as the ISO191xx series of geographic information standards and some of the mobile GIS developments. At present Cadcorp does not offer much support for Java. It will probably also need to extend its applications development skill base as customers for GIS call for their solutions to be embedded in a wider variety of environments. Overall, though, Cadcorp continues to impress through its distinctive operation, and I expect to see the company continue to grow (and thrive) over the coming years.

www.cadcorp.co.uk

Database integration

Increasingly, the mark of a professional GIS is its level of integration with database management systems technology. Although the Cadcorp SIS applications have their own internal table format, the Map Manager, Editor and Modeller can also read/write data to external databases using Open Database Connectivity (ODBC) and Data Access Objects (DAO) protocols (but not Java Database Connectivity or JDBC). The Cadcorp SIS applications can store, edit and view geometric and attribute data from ODBC and DAO databases accessible over a network using the Cadcorp BLOB format, once the appropriate drivers are installed. Cadcorp also supports the OpenGIS Simple Features Specification for point, line and area vector data allowing the Cadcorp SIS applications to access any GIS dataset stored in SQL92 table format or to convert and upload local SWDs into remote SQL92 tables. This ODBC BLOB access offers multiple

user access to tables by only locking the individual rows in the table that are being updated. The Cadcorp SIS applications can also access data in Oracle 8i database tables and can read data in Oracle Spatial Data Cartridge format, although this access is on a single user basis as the Oracle table is locked when accessed.

Web support

Cadcorp has developed a number of innovative web applications using its Active Server Component (ASC) (described in *GI News* September 2000). These include the Ordnance Survey's 'Get-a-map' service, currently at <http://195.26.225.208/getamap.asp> and the 'We are here' business locator service at www.we-are-here.co.uk. The ASC allows geometric and attribute data in a SWD to be delivered through a Microsoft Internet Information Server (IIS) to a web browser through active server pages (ASP) that call ASC methods. The Cadcorp SIS Map Server is a simplified

INDUSTRY CERTIFICATION

Cadcorp SIS product range is OpenGIS certified conformant for

- 1 Simple Features (geometry)
- 2 Coordinate Transformation Services (coordinates and coordinate transformation)

Cadcorp SIS is certified as NLUD accredited by the NLUD Partnership for data capture. Ordnance Survey DNF support via GML 2 plug-in dataset.

DOCUMENTATION

Documentation supplied with desktop products

Getting Started Guide V5.2, 150 pages

User Guide V5.2, 550 pages

Programming Reference Guide, 500 pages (not with Map Viewer)

Above is supplied in hardcopy and PDF.

Jonathan Raper is professor of geographic information science at City University, London. His most recent book, *Multidimensional Geographic Information Science*, was published earlier this year (see *GI News* May/June 2001).

Copies can be purchased from **GI News Bookshop**, books@gjnews.co.uk, Tel/Fax: +44 (0) 1730 261199. Price £47.50 plus p&p.