GeoMedia 5
– consolidating analytical functionality

Robert Barr looks under the bonnet of Intergraph's GeoMedia 5 and GeoMedia Professional 5 and finds significant improvements – in both performance and functionality – hiding behind a familiar interface.

A new release of a leading GIS package causes a degree of excitement among existing users, but these days it may also cause a degree of scepticism or concern. If you rely on a software to efficiently carry out a well-defined and documented task that is part of a regular documented working practice, you dread changes that will entail reworking your application. Incidentally, this is a particular problem in education, where installing new software and rewriting teaching materials is a high price to pay for limited additional functionality. If you look around many campuses, you will find students being taught on obsolescent versions of software.

This leaves software suppliers with a dilemma. Changing the look and feel of an application will upset some existing customers and may even leave them behind; while providing significant additional functionality behind a familiar façade may leave users asking, 'Where's the upgrade?'. This dilemma is exacerbated when companies take different approaches to numbering their products. Some will only change the main version number when the user interface changes significantly and will use digits after a decimal point to indicate changes in functionality. Others will change the full version number for a sufficiently significant set of functional enhancements and will use decimal numbers for minor enhancements and bug fixes. More extreme cases, in an effort to keep existing users on board, include introducing a completely new product but keeping the old name and giving it a new number.

Intergraph has tended to take the middle approach. Having created a new product when GeoMedia was launched, the company has left the user interface more or less intact through all its versions. New version numbers denote significant increases in functionality, while decimal numbers have been used for 'slipstreamed' releases with some additional functionality of which, usually, only existing customers would be aware.

In the case of GeoMedia 5 and GeoMedia Professional 5, a largely unchanged interface hides significant improvements in performance and functionality under the bonnet. (As before, the Professional version includes the facilities for building and editing new datasets, while the version without the tag is designed mainly for browsing, producing hard copy and for analysis.) By providing the product with a totally new topology engine, Intergraph has improved many spatial operations by one or two orders of magnitude. The outputs of the topology engine are now available to developers to use in their own automation tasks. This puts GeoMedia ahead of the GI pack, where the use of topology – and access to it – has been a matter of fashion. A few years ago, there was a prevalent view that because topological relationships can be rapidly

New for 5 is GeoMedia Grid, a fully integrated raster or grid analysis suite.
The example shows hotspots of foot and mouth reflecting concentrations of reported outbreaks.
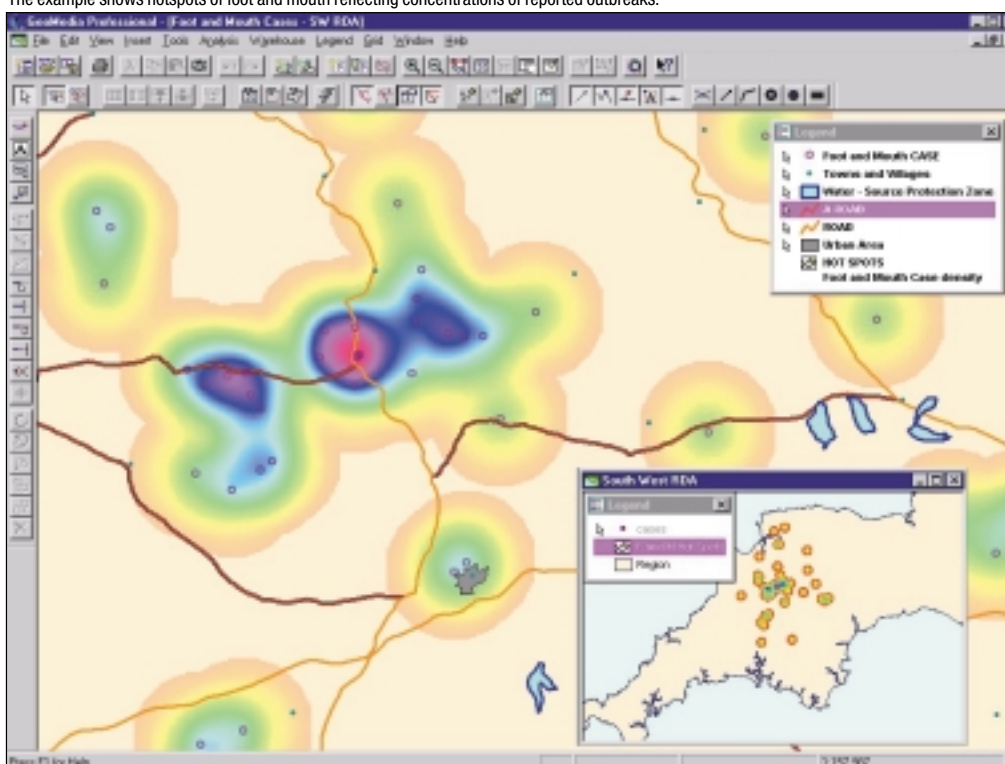
Some of the hardest cartographic tasks are the placement of text and the alignment of text with features. GeoMedia now provides enhanced text facilities and routines for generating better labelling. It also has new facilities to generate custom line styles and symbols as well as grids and graticules. Such cartographic enhancements are very valuable for users who, in the past, have had to resort to transferring GIS output to graphics packages for labelling and other enhancements.

computed 'on the fly', explicit topology is unnecessary. However, developers and other GI analysts have found that having the ability to track explicit topological relationships still allows them to carry out various analytical tasks that are impossible without it.

Since its original design, GeoMedia's great advantage has been the ability to operate directly on datasets (known as data warehouses) that hold data in competitors' native formats. In earlier versions this method of working imposed a performance penalty; however, in version 5 GeoMedia has greatly enhanced data server performance.

New functions

The new version of GeoMedia offers the now-familiar rich user interface, with easy access to deeper functionality from context-sensitive wizards and menus for carrying out almost every conceivable function. This remains a daunting introduction to the program for a newcomer, while being a very productive environment for the trained user.

Behind this interface, however, there now lies a much richer set of analytical functions. Intergraph has enhanced the spatial aggregation functions and provided facilities for dynamic variable-width buffer zones that can be used on-the-fly as a dynamic query without the need to generate new feature classes. As part of a continuing consolidation effort, Intergraph has ensured that the same functions work similarly across all the GeoMedia and WebMap products.

Improved cartography

In the past, GIS output was thought of as ephemeral material that did not need to conform to the highest cartographic standards. However, as the GIS software suppliers have enhanced their products they have discovered that the best of their clients' output is also an excellent and subtle advertisement for what their products can do. Poor cartography has marred some efforts, so almost all the GIS suppliers – in particular ESRI, Autodesk and Intergraph – have worked hard on providing enhanced cartographic facilities.

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Below and Right: GeoMedia's new Spatial Aggregation creates new output by combining separate features classes based on common attributes and/or spatial relationships and generating new 'Functional' attributes using a comprehensive set of logical, mathematic, geometric and statistical functions.
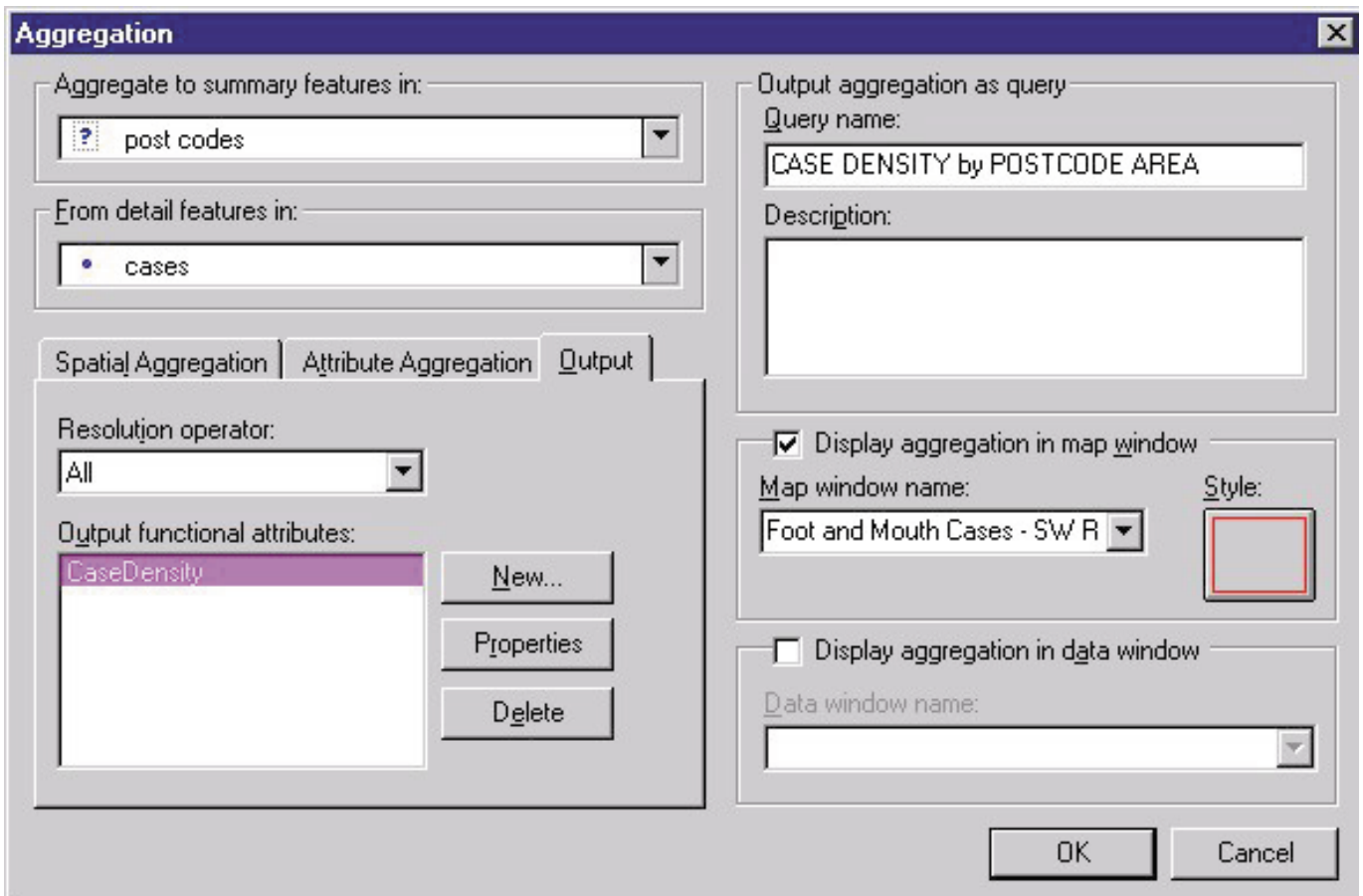
the past, have had to resort to transferring GIS output to graphics packages for labelling and other enhancements. GeoMedia now offers a one-stop shop for data capture (or import) and storage, analysis and the production of publication-quality output.

Improved data capture

The features that differentiate the Professional product from the base GeoMedia product are the data-capture facilities. These have been enhanced in release 5 to make the detailed adjustment of features easier. Objects can be rotated, lines can be extended or trimmed dynamically, and a particularly valuable function allows polygons to be used as split lines. Those responsible for building and maintaining a geographic base will be pleased with these new functions.

The USP of GeoMedia

When the new GeoMedia line was designed and launched, its unique selling proposition was that it allowed seamless and transparent interoperability

with data from other vendors' systems. Over the years, this advantage has waned as other suppliers recognised the need for such native level interoperability and started to provide their own tools. Also, the availability of third-party toolkits such as FME (Feature Manipulation Engine), often bundled by vendors with their products, has helped users with data from many sources.

Nevertheless, Intergraph has worked hard to ensure that while this selling proposition may no longer be unique, the company at least offers the best-of-breed interoperability facilities. This has been ensured in this release by improving the performance of the seamless mapping facility, SmartStore, and updating and improving the data servers for their competitors' products.

It is slightly disappointing, therefore, given Intergraph's strong commitment to the Open GIS Consortium and its relationship with Ordnance Survey, that the GML (Geography Markup Language) facilities available
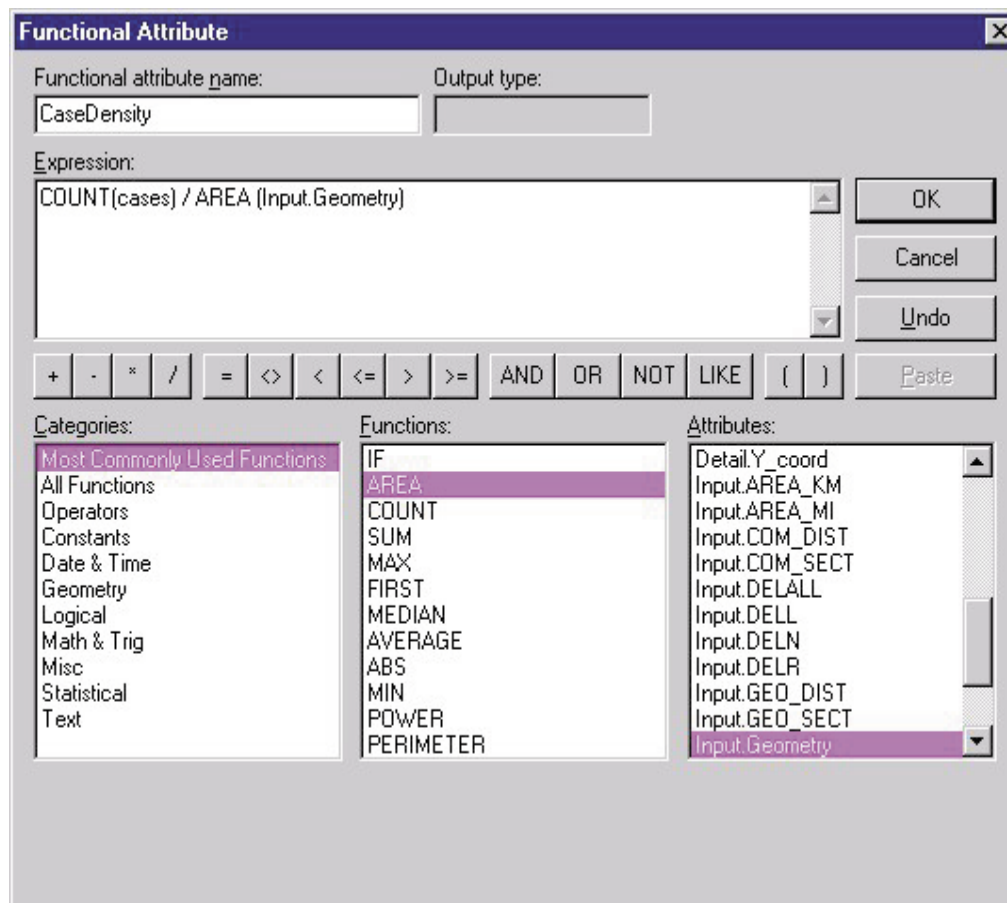
for GeoMedia Pro are out of synchronisation with the level of GML in which Ordnance Survey is currently releasing OS MasterMap. Intergraph's GML data server complies with the more recent 2.1.1 version, while Ordnance Survey is still on GML 2.1. Although Intergraph can help its clients update OS MasterMap schema files and edit the data files to remove obsolete schema references, this is not what the user community was expecting from an open standard such as GML. It will be important for those adopting OS MasterMap to know that they can easily import it into a wide range of GIS products. Intergraph is in a strong position to ensure this

for GeoMedia, but there will inevitably be problems with such an important standard that is still immature.

The next generation

Intergraph has recognised, as has ESRI (and, before them, the Jesuits), that if you get future GIS professionals at an impressionable age, you have a good chance of keeping them forever. GeoMedia and GeoMedia Professional are now available under a free licence for students; and partnership arrangements under the Registered Research laboratory programme make Intergraph products widely available in the academic community. (Intergraph's use of the potential RRL acronym may be seen as a little cheeky by the UK's Regional Research Laboratories, which have been in existence for over 15 years, but it is hard to judge whether Intergraph opted for this intentionally or whether it was a happy coincidence).

Nevertheless, all users of GeoMedia, in particular corporate users, will benefit from having more potential recruits exposed to the product. There is a snag, however: GeoMedia's steep learning curve. The good tutorial included with the packages helps, but it is difficult for those following the tutorial to know why they are doing things. Essentially, it encourages them to follow a series of command sequences and see what happens. In my experience, particularly given a typical student's attention span, few students really learn how to use a product using such a tool. Intergraph will be hoping and expecting that their various educational partners will develop pedagogically richer resources, so this

Recommended hardware specification

Microsoft Windows 98 Second Edition, Windows NT 4.0 with SP4 or later, or Windows 2000 Professional
Pentium-III (or equivalent) or later
250 Mb of free hard disk space
512 Mb RAM
Single monitor recommended, 1024 x 786, 16-bit colour

New and Enhanced features

New analytical functions

Spatial Aggregation (spatial and attribute based)

Functional Attributes (functions to manipulate and generate new output)

Analytical Merge

Enhanced analytical functions

Attribute-driven, variable width buffer zones

Buffer zones output to dynamic query (rather than a feature class)

Entirely new topology engine for faster performance and greater spatial definition

Topology functions and output exposed in the API

Output (new)

Labelling – oriented text, curved text, leader lines, and individual text style overrides

Resolve Text conflicts

Automatic grid and graticule generation

Export

Added export to CAD

Data capture and maintenance

Enhanced Trim and Extend Commands – dynamically or by key-in

New construction features using distances from two known points

New user-defined attribute picklists during capture and edit

Reverse digitisation direction

Enhanced analyse/report geometry

Data servers

New – DB2, SmartStore and formatted ASCII (e.g., for GPS output)

Performance enhanced – All

Updated to latest versions – Oracle 9i, MapInfo and AutoCAD

Raster

ECW support and enhanced MrSID performance

Improved GUI and workflows for handling multi-image datasets

situation should be remedied in the future.

Conclusion

GeoMedia remains a very serious contender in the GIS marketplace. I am not sure that this release really justifies the version 5 nomenclature; version 4.5 would have been closer to the mark for me. Even so, many users will appreciate the enhancements and will not be inconvenienced by having to unlearn familiar procedures. GeoMedia Professional 5 will give current and potential users the confidence that they are using a product with an excellent pedigree and a well-marked development path. Such stability and sureness of purpose is very reassuring when one invests the time, money and effort to put GIS software to use in real-life projects.

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Text can be aligned or fitted to existing features and the style of individual incidents of a text theme can be overridden, to avoid clashes for example.