

Business Intelligence *in place*

The rapid rise of 'location intelligence' is both a threat and an opportunity for GIS professionals.

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A Business Intelligence (BI) system enables better decision making by combining the extraction, analysis and presentation of business information. It typically consists of a web browser dashboard that provides a single, personalised window into corporate information stored in a data warehouse.

In the typical BI system, data is extracted from backend systems – such as financial, customer relationship management, inventory, asset management and human resources – and moved into the warehouse, where it is restructured for efficient analysis and reporting.

The BI system handles access, security and administration of the warehouse. It enables the chief executive to track performance, for example, or the sales manager to compare sales revenue by product line and store. The customer service manager can see which of his or her engineers is trained to fix a particular piece of equipment or the maintenance history of an asset.

Glen Rabie of BI software company Yellowfin explains: 'Dashboards communicate complex information quickly. They translate corporate data into graphics using gauges, charts and other visual media to show multiple results together.' What makes this interesting for the GIS world is that now they are adding maps.

'When people see something on a map, they understand it, and it allows them to see relationships between different pieces of business data that they didn't previously appreciate,' he said.

Users are embracing location-enabled BI because it is already familiar and enjoyable to use, thanks to Sensis' *Whereis* site and real estate sites such as *Homehound*. Also, Satnav and Google Maps have played a huge role in introducing the power of GIS to the mass market.

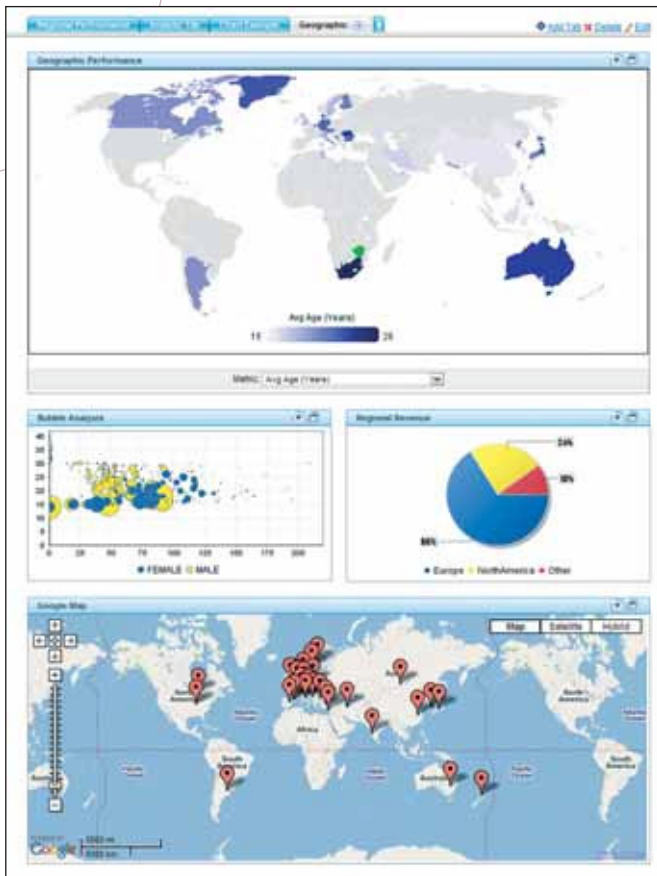
There is a 'wow' factor when executives see their everyday data presented for the first time with a map. For a telecommunications company it may be seeing a link between the amount of money spent by the marketing department and the busiest exchange, or being able to target those customers who are on exchanges with spare capacity and avoid offering others services their exchange cannot support.

For an agribusiness executive it may be seeing the impact of the amount and timing of fertiliser application on crop yield on a map derived from satellite imagery. For an insurance company it may be seeing the location of their policy holders and the value of insured property located in the path of an approaching hurricane. It could be the ability to spot potentially fraudulent claims after a hailstorm because the site of the damage is well away from the sites of other claims.

Location-enabled BI has other benefits. It can streamline compliance reporting and reduce the knowledge loss when a staff member leaves or retires. A new staff member can see, for example, where all the service centres and distribution points are through an easy-to-use, intuitive interface.

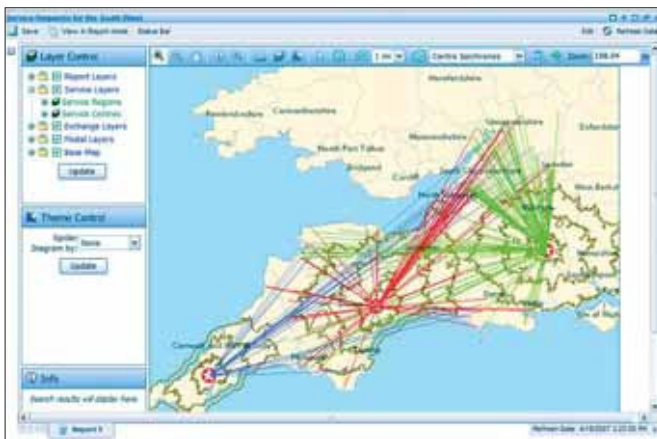
For those who are familiar with GIS, this is not rocket science. GIS professionals have been analysing business data and combining themes like this for years. What is new is GIS in the boardroom. GIS is leaving its niche behind. The term 'spatial information' has been replaced by 'location intelligence'.

The difference is that before, GIS implied expensive customised systems. They were time-consuming to build and required people with specialist skills to run them. Department managers might ask the GIS specialist for a thematic map, wait for it, look at it, realise it didn't give all the answers and come back with a different question.



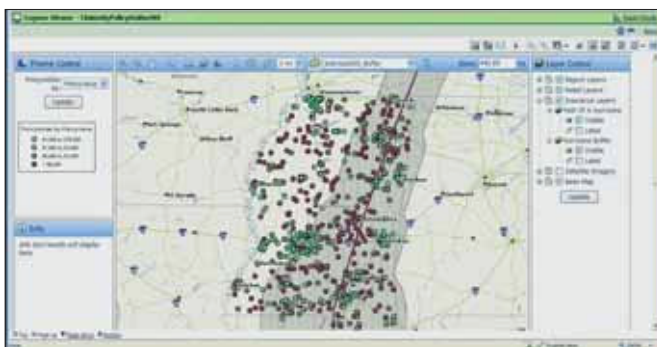
Yellowfin

A dashboard from Yellowfin analysing worldwide client distribution. From top: Worldwide client distribution, colour-coded by age; bubble chart showing gender; world revenue analysis; client distribution.



Pitney Bowes MapInfo

The service manager can see how by different depots handle service calls and the implication for travel time.



MapInfo

Executive dashboard showing individual insurance claims colour-coded by policy value. The grey shaded area indicates the path of a hurricane.

Now, with location intelligence, managers can get their own answers and revise their search and presentation criteria repeatedly. They can start with a map, drill through to other data sources and reports for more detail, select certain records from a table (for instance, sales revenue by product line within a state or territory) and create a new colour-coded map (this is known as bidirectional integration). They can also choose to receive email or SMS alerts if a value goes outside a predefined range.

Building a location-enabled BI system is also easier, thanks to mainstream web-based standards and programming interfaces such as XML. Flash animations can be embedded to display data over a timeline.

Microsoft's impending SQL server 2008 spatial extension is expected to further simplify location-enabled BI. It will add location-aware commands to the standard repertoire of Microsoft programming languages, which are known to most programmers and application builders.

So how is location intelligence added to an existing BI system? It can be as simple as adding x and y co-ordinates to a record in the data warehouse. These may be derived from a postcode, from a Census district or from the asset record in a GIS.

The process of extracting, transforming, and summarising into a form data that can be used by the BI tools is complex, and will expose GIS professionals to mainstream IT technologies such as Data Warehouse Extraction, Transformation and Load (ETL) tools.

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Nigel Lester, the sales manager at Pitney Bowes MapInfo, explains other implications for the GIS professional.

'GIS people must not underestimate the benefits of a relatively basic technical capability when it is embedded in a company's familiar BI environment and applied to business information. Being able to visualise data geographically is a big deal for BI users, and there are so many of them. You are not empowering five people, you are empowering 5000 to apply their knowledge and experience to what may have been previously insoluble problems,' he said.

Higher visibility for BI in an organisation can also make it easier to get funding for projects. The GIS team may be able to spend less time fielding one-off requests and more time thinking and working strategically. As they explore the new BI's capabilities, users will ask for more and more.

GIS people will need to understand the requirements of a wide variety of departments in order to identify which data will be extracted from the GIS and how often. Users will assume locations in the BI are 100 per cent accurate and will make decisions accordingly unless they are told otherwise. Its limitations must be understood and improvement programs must be put in place when required. When users discover an error, there must be a process to get it fixed, so that confidence in the system is maintained.

External datasets add more depth to company information. This might be maps of flood zones for an insurance company or the location of doctors' surgeries for a discount chemist. Finding who has the most accurate and complete version of this data, obtaining it, and keeping it up-to-date is not a trivial exercise.

Custodianship programs that encourage public and private sector organisations to share their data will help.

Often, when many datasets are combined, they don't fit together properly or easily. This can raise doubts about the cleanliness of the data in the combined dataset. Misaligned data will lower user confidence – and it is being highlighted

by the increased use of highly accurate orthophotography. Superfluous nodes in parcel boundary data will also affect display speeds and performance. Tools such as Topo Manager from Spatial Tapestry will enable the GIS group to automatically test, clean and align their datasets before rolling them out in mainstream BI.

While some companies will be happy to have quite basic mapping capabilities, others will want more. 'Maps answer many questions,' says David Merchant of Cognos, a BI company recently purchased by IBM. 'But they often also raise more, at which point you will want closer ties to the GIS.'

A good example is SP AusNet's Outage Information Centre (OIC). SP AusNet owns electricity transmission and distribution networks, as well as a gas network in Victoria. Its Network Operations Centre has used GIS to assist in the restoration of power outages during periods of high activity (storms, bushfires and other weather extremes).

GIS specialists must expect more competition from other IT professionals...

At such times, many stakeholders in the organisation need to access information. Executives need to know the cost of the outage. The customer services and corporate communications teams need to see the extent of the problem and the progress of repairs to keep customers informed and respond to questions from the media. The OIC enables the Network Operations Centre to concentrate on restoring power rather than managing internal communications.

At SP AusNet, raw data is extracted from the GIS and Outage Management Systems every 10 seconds, and within 10 minutes, efficient summarised data structures are constructed for analysis and reporting by Cognos and Eview software.

Stakeholders view the information geographically, and then drill down to detail such as the comments from customers who reported the power outage, outage status information and the actual repair tasks undertaken. Executives can see the financial impact of the outage at 15-minute intervals. The OIC implementation took less than three months and has successfully supported SP AusNet through 11 high-activity events since February 2007.

SP AusNet Enterprise Solution Architect Jeff Warke said the project had provided a solution to the immediate problem of outage data, as well as a reporting foundation that could now be applied to other parts of the business.

For GIS professionals, BI is both a threat and an opportunity. GIS technology will become more familiar, and so GIS specialists must expect more competition from other IT professionals. The demands of mixing datasets of uncertain accuracy and presenting meaningful results to executives will expose GIS professionals to a whole new set of demands.

On the other hand, geography has never been so important to business people, and it's getting more important every day. That's got to be good news.

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