

Location intelligence gets smarter

Spatial and geospatial data help businesses go the distance. *by Sara Aase*



Private companies, governments and nonprofits are discovering that geographic and spatial information analyzed in new ways offers better perception of business problems and can provide unique solutions. Spatial data, which represents things that exist in space (for example, X-rays, machine parts or molecules), combined with geospatial data, which represents things in reference to a location on earth (such as roads, rivers or building footprints), grants additional insight into so-called location intelligence. The demand for this kind of location intelligence is driving the integration of spatial data into business intelligence (BI), data warehousing and data mining systems.

For instance, the United Kingdom's largest auto insurer is offering a novel "pay as you drive" approach that relies on in-car global positioning system (GPS) devices that record such information for each driver as time of day, type of road and total mileage. A Teradata Warehouse collects, correlates and analyzes the data and combines it with other information like traffic patterns, for instance. This information, in turn, is connected to the insurer's billing system, providing its customers with a transparent, detailed and controllable assessment of factors that determine their auto insurance costs.

Increasingly, open-source spatial data applications can be connected to the enterprise through translator applications that are

built on enterprise service bus (ESB) and extensible markup language (XML) engines. Indeed, popular geographic information system (GIS)-based Web services such as Google Earth and Google Maps have made systems managers realize that, in some cases, all they need to do is turn on a map feature in their BI applications to give users immediate access to new types of geographic intelligence. Maturing universal standards to handle spatial and geospatial data, along with maturing standards of ESB and XML, will allow further interaction between BI and GIS.

This interaction is also enhanced by the growing trend toward building service-oriented architectures (SOAs) that can take advantage of active data warehousing and increased data mining capacities. SOA is an approach to building component-level applications and business processes to provide specific services. The interface definition of each application “hides” the implementation of the language-specific service, making it unnecessary for each component to speak the same language.

These SOA trends point to a broadening of spatial information management (SIM) across the enterprise, increasing integration within the next few years to the point where it becomes commonplace to track and analyze physical location and spatio-temporal data. In short, SIM is quickly becoming an important but invisible asset.

Spatial standards mature

In mid-2004, the newly established National Association of GIS-Centric Software recognized the need to standardize GIS-centric databases to provide for bi-directional integration. As a result, IT managers are finding more certified geographic-information software and applications built with the enterprise in mind: integrated GIS systems with non-redundant data storage that allow intercommunication among the different

applications. However, although this software is the most mature of the spatial technologies, its vendors can expect to see their lead in this market space constrained somewhat in the next few years. Companies are turning to major IT infrastructure vendors—instead of GIS vendors—for comprehensive, spatially enabled enterprise solution platforms (ESPs).

The accessibility of some geospatial-enabling technologies through open application program interfaces (APIs), application-independent schemas and standard programming languages allows

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for more shared information within an organization; yet that same accessibility also demands greater caution.

One challenge is that since the technology can be integrated with customer relationship management, supply chain management and enterprise resource planning (ERP) applications, the communal nature of these systems requires steps to ensure multi-level security. In addition, as geospatial data is integrated into multiple applications, another necessary hurdle to overcome—at least in the short term—is that of data quality management.

Integration of so-called geolocation technologies such as GPS, wireless local area network (WLAN), radio frequency identification (RFID), cellular networks, networked sensors, sonar, lidar and radar are emerging in many industries. Transportation and retail industries, for example, use GPS and RFID to track the location of mobile workers and warehouse goods.

Companies will increase their use of these technologies for both simple and complex calculations as they move closer to event-driven architectures and real-time process management.

Growing new opportunities

At a deeper enterprise level, GIS integration will depend on the increasing adoption of SOAs.

Analytic applications access data from the data warehouse and often ask, “What has been happening?” and then project what happened in the past into what might happen in the future. For example, commonly examined

data might refer to which products or services customers are purchasing.

Leveraging SOA unlocks the analysis of information stored in a data warehouse and enables the exchange between the active data warehouse and the rest of the enterprise to happen in real time or near real time. Imagine being able to add delivery route information to the analysis. With this additional data, organizations could map product complaints to late deliveries due to new road construction, for instance.

GIS technology allows all sorts of map variables to be combined with other data to yield complex modeling outcomes over large areas of data. Given the drive to integrate SIM technology across the corporate enterprise, it won't be long before this kind of powerful predictive data mining capability is also in place. **T**

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