Using **Location Intelligence** to Maximize the Value of BI

Until it added spatial analytics to its business intelligence system, one of the country's leading retailers was wasting money in how it routed 10,000 technicians who make 11 million home-repair calls each year.

When a building material manufacturer enhanced its business intelligence-based warranty system with data-driven maps, it quickly became apparent that claims related to premature product degradation were clustered and shared some unusual climate characteristics.

Forward-looking insurance companies are using a combination of location data and business intelligence to create policies based on the actual economic and geographic realities of a precisely defined area of interest, rather than just ZIP code boundaries.

What do these three scenarios have in common? In each case, an organization brought together business intelligence (BI) and geographic analysis to discover powerful new insights. That's location intelligence (LI).

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Consider: LI integration enabled the above retailer to dramatically improve the way it forecasts demand and allocates resources, saving it millions of dollars annually. The

building material manufacturer is now better able to predict future areas of product failure and proactively address degradation problems. As for the insurers, they're learning that LI delivers analytics simply not achievable via business intelligence or geographic analysis alone.

These aren't isolated instances. Increasingly, organizations in all kinds of industries are learning that the primary benefit of location intelligence is comprehensive analytics, not just the ability to see where something happens or exists. According to industry observers such as Gartner, Inc., vastly improved and more sophisticated analytics represents the next evolutionary step in business intelligence.[1] Moreover, these observers say that adding new capabilities such as spatial analytics maximizes the value of a BI system to expose insights that drive better decision making.

This IDG white paper provides an overview of location intelligence and proposes that the time has come to integrate BI and geographic information systems (GIS) to yield a new spectrum of competitive business insight. It then explores specific synergies between these two well-established technologies.

Understanding the power of 'data-driven decision making'

For the better part of a decade, Gartner has consistently ranked business intelligence as one of the top technology priorities of CIOs. It's not hard to see why. Business intelligence unites data, technology, analytics, and human knowledge to optimize decision making and ultimately drive an enterprise's success.

At its most basic level, BI is reporting. It combines data from different systems and repositories (such as sales, marketing, operations, finance, procurement, HR) into a data warehouse. This enables exploration, analysis, and reporting across slices of major dimensions of the business, like time, department, customer, product, region, or individual location.

BI can be used to analyze and optimize business at varying

levels, from departmental deployment to true enterprise BI systems. The typical BI system accesses data from a corporate data warehouse and organizes it into dashboards designed to report specific facts and data based on the job function and decision-making responsibility of the reviewer.

In recent years, BI has expanded beyond reporting to include predictive analytics, "what-if" scenario analysis, unstructured data analysis, and more.

Is there any real evidence so far of a business intelligence payoff in the corporate world? The *New York Times* recently reported that researchers are finally quantifying just how much better data-driven decisions are. According to researchers at the Massachusetts Institute of Technology, companies that adopt "data-driven decision making" achieve productivity that is 5% to 6% higher than could be explained by other factors, including how much the companies invested in technology.[2]

A 5% increase in output and productivity, the researchers say, is significant enough to separate winners from losers in most industries. Companies that are guided by data analysis, the researchers conclude, are "harbingers of a trend in how managers make decisions."

How location intelligence improves performance

Location intelligence is defined as the capacity to organize and understand complex data through the use of geographic relationships. LI organizes business and geographically referenced data to reveal the relationship of location to people, events, transactions, facilities, and assets.

As IT advisory service Ventana Research has observed, the need for this sort of intelligence is more pressing than ever: "Location intelligence applies geographical or spatial context to information to inform actions or responses to business opportunities. For example, consumers need access to locational information for product search and shopping, and businesses can gain insights from knowing

1. Magic Quadrant for Business Intelligence Platforms, Gartner, Inc., January 2011

2. "When There's No Such Thing as Too Much Information," *New York Times*, April 23, 2011

the location of factors ranging from their own assets to competitors. In fact, there are location and geographic contexts to every element of business—and organizations overlook it at their peril."[3]

LI presents a significant opportunity for organizations in nearly every industry to leverage location data as part of their everyday decision-making process. Any analysis relating to business processes, such as customer relationship management, marketing promotions, service and supply chain optimization, risk management, and operational efficiency, benefits when location and business data combine to make sound data-driven decisions.

Every business event or transaction happens at a specific location for reasons that, when clearly understood, comprise the "intelligence" component of LI. As a result, maps are becoming the language in which to present data, exposing spatial relationships and influences that just aren't visible in traditional tabular views of data. This leads to new insights that explain where a problem or opportunity exists and why.

The synergies between BI and GIS

For many years now, businesses, academic institutions, and governments worldwide have implemented geographic information system technology. Government users pioneered GIS for determining lot boundaries, water runoff, population movements, and more. GIS is widely used to coordinate evacuations and emergency supplies, and monitor the spread of diseases, among other things. On the business side, distribution companies have used GIS to monitor and manage their fleets for years. Energy companies continue to use GIS to map and manage power distribution.

Many of these same organizations also employ BI in one form or another to analyze and understand their business data.

Today, forward-looking organizations are learning firsthand how adding spatial analytics and interactive mapping to their BI systems can dramatically enhance decision making, giving them a powerful new tool to proactively manage

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3. "Why Geography Matters to the Enterprise," Ventana Research, 2010

their operations. They're learning, in short, that the time to integrate LI is now.

How exactly does the combination of business intelligence and GIS benefit your business? Here are just a few examples of the powerful synergies between these two technologies:

- **Retail and Services.** The IT organization at a large national retailer wanted to improve reporting from its business intelligence system. When the CIO was shown tables and charts with a spatial or geographic component, he immediately saw the potential to increase the use and value of BI data throughout the organization, particularly in the marketing group. Managers now use this data to plan, implement, and evaluate the effectiveness of local marketing efforts, with better segmentation and loyalty programming. They can analyze individual store or regional performance based on many different parameters. In addition, they're better equipped to assess the impact of a disaster, such as a storm or flood. Perhaps most important: Time-to-action is faster since spatially enabled reports are generated on demand.

- **Utilities and Communications.** Many utility and communication companies use GIS to manage assets and operations, including making smart grid systems a reality. But now more and more of these companies are integrating spatial analysis into their business operations. For example, utilities can map where they have the highest incidence of nonpayment, enabling them to segment their marketing efforts—and customize product or service offerings, including payment programs—by neighborhood, region, or user profile. Geographically analyzing customer service problems can lead to a better understanding of underlying issues, such as language barriers by region or lack of access to a customer service center.

- **Oil and Gas.** Location is everything for oil and gas companies. Every major decision—about where to drill, where to recover, where to route delivery systems and refineries—is predicated on geographic and spatial factors. But of equal importance are decisions about performance and costs. Increasingly, oil and gas companies are combining geospatial data with BI data

to answer such questions as: Which leases are most profitable, and why? Where do royalties cost the most? Where are operational costs too high? For these companies, incorporating maps within their BI reports and dashboards delivers instant insight. Users easily pan, zoom, and click on maps to interact with tables, charts, and graphs within the report. The result is an intuitive end-user experience that answers increasingly vital "where" questions.

■ **Insurance.** Every policyholder lives at a location, commutes in varying levels of traffic, and lives in a region that may or may not be prone to environmental risks. The combination of spatial data with BI data delivers insurance analytics not achievable via BI or GIS alone. A spatial lens on BI data for policies, expenditures, underwriting, environmental risk, regional demographics, and marketing strategy can take the guesswork out of where to invest, and where not to. Consider: An insurance company can map the addresses of insured structures and overlay floodplain boundaries to identify all structures within the floodplain. With this information, the insurer can calculate the total financial impact on reserves from a potentially catastrophic flood.

■ **Supply Chain Management.** Presenting supply chain performance data in the form of a spreadsheet neglects the real-world influence of geography on transportation. For example, one retailer knew the nodes of its supply chain fairly well as rows on a spreadsheet. But not until the routes between manufacturers and distribution warehouses were actually mapped did it become clear that every shipment ended up crossing the same bridge. The company's operation would be negatively impacted if this bridge were closed. Today it's possible not just to put the supply chain in a geographic context, but to correlate

Esri™ GIS Solutions for Location Intelligence

Esri™ software is used by more than 350,000 organizations worldwide, including most US federal agencies, all 50 US state health departments, 24,000 state and local governments, and many Fortune 500 companies. Esri technology integrates with leading BI systems to provide location-aware data and analysis, including:

> IBM
> Information Builders
> Microsoft
> Microstrategy
> Oracle
> SAS
> SAP
> Teradata

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it with information that could impact its logistics, from natural disasters to security alerts. As Ventana Research has observed: "Having a unified view of information that includes the locations of your products and their places in the supply chain can enable you to monitor the continuity of business and manage its efficiency through delays or crises."[4]

Conclusion

Business intelligence is all about extracting high-value information from vast amounts of data, and presenting it to the right people in a highly consumable format. Adding GIS to enable location intelligence to BI output allows decision makers to visualize the influence of geography on behaviors, activities, and processes. The result is improved data-driven decision making.

Organizations both public and private are starting to grasp the business cases for location intelligence. Esri, whose GIS solutions work with software from the leading BI providers, is in a unique position to show how location intelligence yields a new spectrum of competitive business insight. The time to get started is now.

To learn more about location intelligence and Esri BI technology partners, go to: **esri.com/BI**.

For a case study on this topic, go to **esri.com/searscasestudy.**

4. ibid