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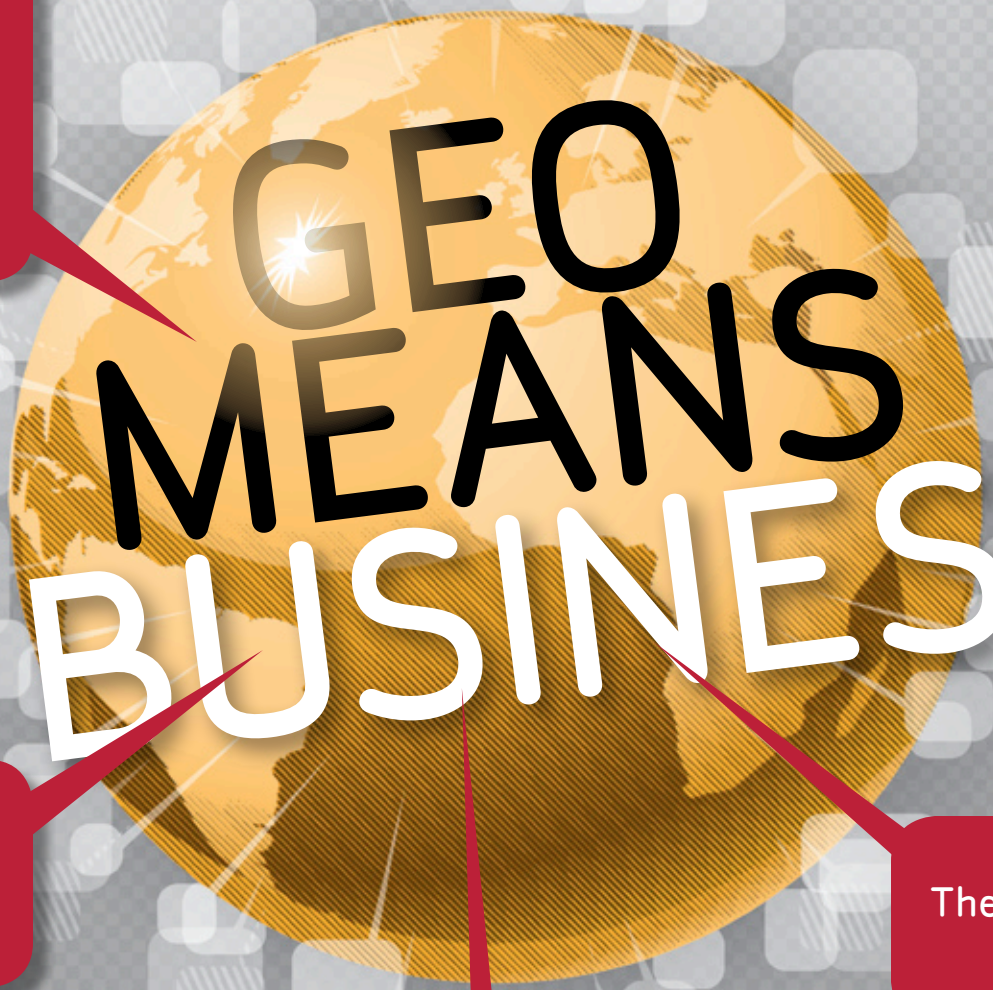
LOCATION IN THE LANGUAGE OF BUSINESS

Executive Interviews: Time Warner Cable & National Geographic



GEO MEANS BUSINESS

Automotive Safety & Fuel Efficiency

Finding New Markets

The Power of *Where*

Geo Means Business!

GIS to Dashboards: For Everyone in the Enterprise

ASK A SIMPLE QUESTION, GET A SIMPLE ANSWER . . . THAT doesn't work anymore. We live in a global economy where the price of a product depends as much on supply and demand in your local store as it does on cost to manufacture, transport and market. The world is full of confluences; nothing acts as a separate entity. Factors five or five thousand miles away can have an equal influence on our lives as consumers and citizens.

Perhaps there is no better system than geographic information systems (GIS) to understand the interconnections and machinations of our 21st Century world. GIS is a technology that combines data for capturing, managing, analyzing, and displaying all types of geographically referenced data. First used commercially four decades ago, the technology has come a long way. No longer the exclusive domain of the desktop analyst working away on a special project or creating one-of-a-kind maps for a single problem or select group of stakeholders, GIS can benefit and be used by anyone.

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Putting Business in the Framework of Location

We use language to communicate spatial relationships on a daily basis when we use phrases such as "alongside," "linked to," or "opposite." We also automatically perform analysis on what we hear and are able to interpret, and infer the important geographic inter-relationships and connections. Concepts and word constructs such as "near to," "in the middle of," or "within reach of" influence our perceptions of where we live, eat, shop, teach our children and vacation. Because of this, it is only natural that business is rapidly adopting 'where is...?' as one of its most important operational questions.

Intuitive Web 2.0 executive dashboards put powerful geographic analytics at the fingertips of non-experts. The complexities of advanced models and complicated formulae can be hidden behind easy-to-use interfaces and guided workflows that provide instant access to information. Decision makers no longer need to be content with asking simple questions like, "What are our sales for this store?"

Done correctly, GIS exposes hidden relationships and helps everyone explore and investigate market conditions and performance. Questions about sales revenues can evolve into "How well are we performing in this trade area?" or "What impact would a specific marketing campaign have on revenues from this segment of our custom-

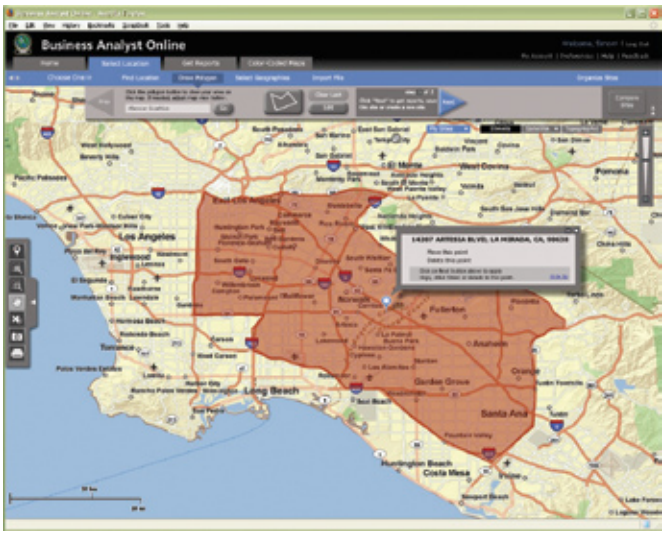
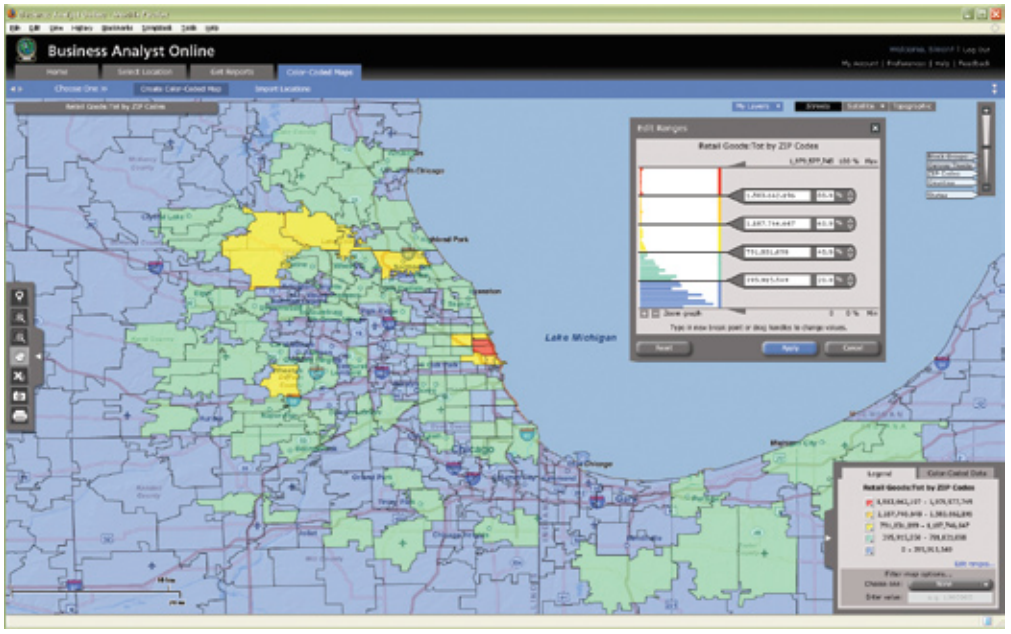
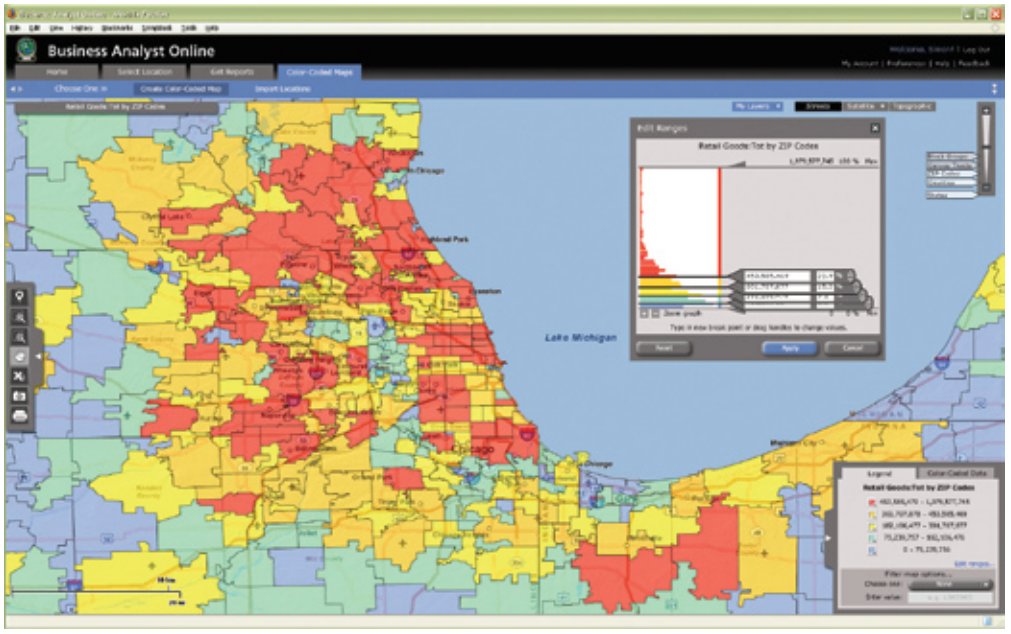


FIGURE 1. Rich Web 2.0 applications provide an intuitive environment in which to mix structured workflow and free form exploration.

FIGURE 2. Today's executive dashboards feature easy-to-use widgets and controls that provide dynamic feedback. As you move sliders and dials, the results are automatically updated, improving insight and understanding. These charts show expenditures in retail goods by zip code for Chicago, Il.





> "Maps have always been appealing. We are hardwired to understand them, and there is no better medium to assimilate and communicate national information and global trends."

ers?" or "What's the likelihood that we can get new clients in these neighborhoods based on this pricing promotion?" See *Figure 1*.

Because GIS is both open and extensible, it's also easy to connect into the enterprise. Asking questions and getting answers that matter has never been simpler. Analysis has become elastic (because users can change variables easily without requesting a new modeling scenario from someone else), and data can be seen in context with real meaning because GIS provides access to timely information and provides tools for changing scenarios. We have moved from accepting theoretical outcomes to testing scenarios and exploring results in the light of reality and experience. GIS has rich programming languages, application templates and connections to user-centric environments such as Microsoft's Silverlight and Adobe Flex, allowing users to fast track application building by configuring the template rather than constructing an application from scratch.

Towards GeoBusiness 2.0

> "Collaboration based on geographic information is now commonplace, and maps have become a *lingua franca* for sharing plans and discussing business strategy."

At ESRI we've long considered the customer experience and know that GIS is more than cartography combined with databases. End users and developers want to take full advantage of the Web in terms of both technology and expectation. The iPhone generation has raised the bar, and now the way we interact with software has changed forever.

Business users expect to interact with gadgets and widgets like sliders, gauges and controls that let them modify or fine tune business models and analytics in real time. They want to see the impact of their changes reflected automatically in charts, maps and tables, providing feedback that is both dynamic and easy to understand. As a result, the exploration, investigation and decision-making processes have become intertwined. Executives and managers can now create their own insights by trying it for themselves rather than asking the analyst to "go and run another set of numbers."

Of course, GIS has also benefitted from progress in information technology such as faster computers, rapid development environments and more open platforms. These advances enable the rich applications we see today and drive innovation across the industry. Spatial analysis is taking advantage of this and fast becoming ubiquitous, reaching across the corporate and government enterprise and unifying departments. Collaboration based on geographic information is now commonplace, and maps have become a *lingua franca* for sharing plans and discussing business strategy.

The net result of all this progress has been a paradigm shift for the value of GIS data. Business managers, boardroom executives and information workers can now access rich visualization and analytics anywhere across the organization.

Every well designed dashboard now comes with the expert analyst built-in. Users can now fine tune their analytics using simple gadgets and controls. See *Figure 2*. Zeroing in on an idea, exploring a hunch or validating a business concept can be done by anyone, and new understanding is created in the process. Analysis no longer needs to be structured or linear; it has become elastic, expanding as the user investigates and explores new ideas or pursues intuition. The models can then contract to a preconfigured state when the user wants to start over again.

Ensuring Data Integrity

Data integrity is critical to good business decisions. Many datasets such as population density, household income or retail expenditure tend to be highly skewed; the real world doesn't always understand our desire for symmetry. Much of the information we use in decision making is not normally distributed; it doesn't fit the bell shaped curve we all learned in high school. Vital data like expenditure, income, population density or age can be influenced by outliers.

If the data is plotted incorrectly, for example by relying on the mean instead of the median, then the data and pattern displayed can be a misrepresentation. Overemphasis of data extremes can miss the true variation and consequently adversely impact business decisions. See *Figure 3*.

So how do you ensure that you can make sound decisions based on your data? Most GIS systems make it easy to quantify data using ranges based on standard deviations. This method will highlight variation above and below the average – an important first step in establishing a baseline for key performance indicators. Natural breaks will identify distinct groups or where data are clustered. However, most color-coded maps we see in dashboards and in mainstream media tend to use equal intervals, with all their inherent problems. This use will change as more systems are integrated using rich visualization toolkits such as Silverlight or Flex, because users and developers will have access to toolsets necessary to visualize data in the most appropriate and insightful way.

From Cities to Boardrooms, Maps Provide the Answers

Maps have always been appealing. We are hardwired to understand them, and there is no better medium to assimilate and communicate national information and global trends. At the local level, GIS is changing the way citizens interact with government and ensuring they get the services they need. For example, at the City of Houston, the *My City* community mapping site provides a detailed, accurate snapshot of the city. When fire crews or construction workers need access to fire hydrants, water and gas lines details, they use the same data that is made available to the public via the *My City* portal. Interested in crime statistics for your neighborhood? *My City* tells you, courtesy of the police database. Want to see water levels in a bayou near you? Check out the flood gauges and understand potential impacts with a link to the Office of Emergency Management.

GIS gives you more than a tour of street-level information. It gives context to data, making it meaningful and offering it up in a digestible format we all can understand. As GIS data and mapping technologies have become more accessible, especially when embedded in other systems like BI and CRM (business intelligence and customer relationship management), sound techniques and good judgment need to be applied. We need to understand how to use geographic data and tell the correct stories through maps. As with statistics and charting, it is all too easy to manipulate tabular data to show the story we may want to tell on a map.

Maps and images give the strongest instant impression of any presentation technique. Display a large area of red on a map, and we naturally draw a conclusion – that area must house something important. The human eye scans images and picks up on pockets of similar colors, as well as variations in color or patterns on thematic maps to gain knowledge quickly.

In the next few years, we can expect to see major advances in

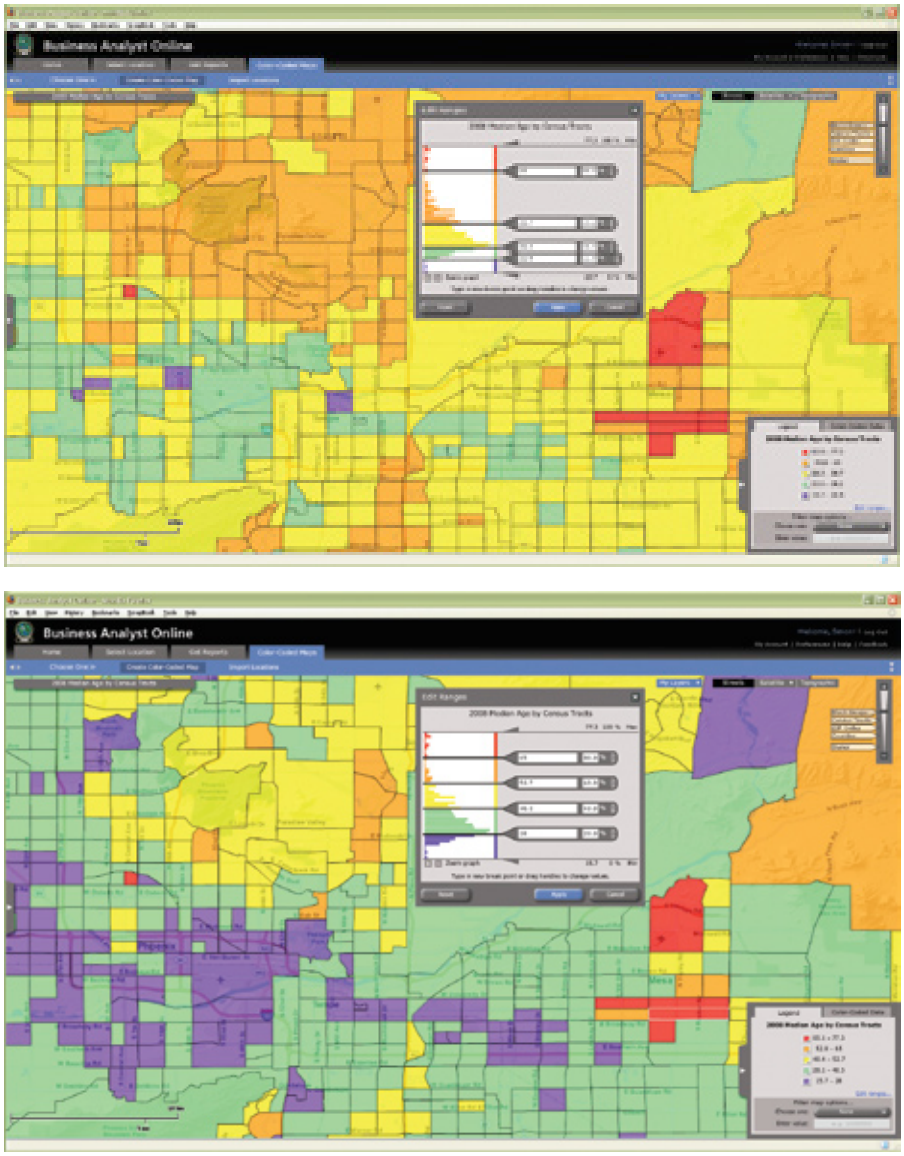


FIGURE 3. How you display information strongly influences the conclusions people draw from maps. Different techniques can suggest wide variation even with the same variables. Charts show 2008 median age distribution in Phoenix, Ariz.

map presentation tools based on rich visualization toolkits such as Silverlight or Flex. Not only will they reduce the time and costs to develop intuitive applications, but also they will provide sophisticated map management widgets that mirror today's chart and graphing wizards in products such as Microsoft Office.

Location data has come a long way, and in the last three years particularly, it is truly revolutionizing the way organizations use geographic information. Realistically, there is no other way a business owner or decision maker can efficiently sift the vast volumes of geographic data we all use in our everyday lives. GIS exposes the knowledge and expertise of the analyst through easy-to-use tasks and repeatable models.

We are seeing more and more business professionals and knowledge workers consuming GIS-derived maps and data. For managers and executives, GIS continues to be an enabler of optimization in business and government. Finally, GIS has fulfilled its promise of geographic business intelligence. Today we know that there are better answers. Perhaps it's time to expand our horizons and start asking harder questions. ☒

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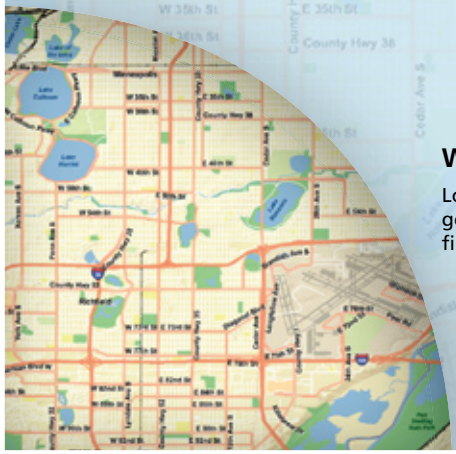
World Imagery

See a natural view of the earth at multiple resolutions.

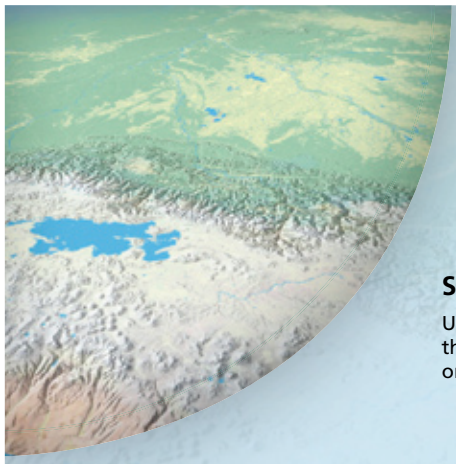


World Street Map

Locate places and addresses, get driving directions, and find places of interest.

Political Boundaries

Add your own current events or population data layer to the political world globe.



Shaded Relief

Use with your maps that don't include orthoimagery.

Quick-Start Your GIS Projects with Free Online Maps

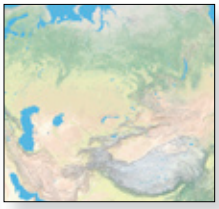
Having the right data when you need it can mean the difference between success and failure. When you are trying to meet a project deadline, the last thing you want to do is spend valuable time searching for data sources and then compiling and prepping the data.

With ArcGIS℠ Online, you have free access to a comprehensive collection of 2D and 3D basemaps to which you can easily add your own local data or services.

Online content includes imagery for the world, world street map, shaded relief, topographic maps, and more. Use it as the foundation for your GIS work when you need to add context for your geographic analysis that extends beyond your normal working area.

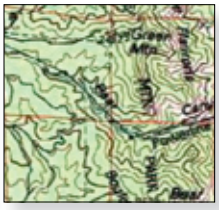
ArcGIS Online content is prerendered, ready-to-use, and hosted by ESRI, so you save time and money because you don't have to invest in additional hardware, staff, or training. It also frees you from data management and data update activities so you can focus on your mission-critical work instead.

Historical World Map



Physical World Map

World Protected Areas Map



U.S. Topographic Map

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