

Visual Shortcuts to Business Insight

A new generation of data visualization tools helps front-line users find real-time solutions to business problems.

by Bill Tobey



As organizations develop their business intelligence (BI) infrastructures and work to leverage those assets more widely across the enterprise, many are finding that conventional analytical tools don't fit the needs of all their prospective users. Reports designed for strategic analysis by back-office power users are often ill-suited for front-line business users making on-the-spot tactical decisions. Many of these users are already overwhelmed with data and are untrained in statistical methods. They have difficulty using conventional techniques to extract useful insights that are immediately applicable to their own responsibilities. Easy-to-use analytical tools that are more suitable for real-time decision cycles are urgently needed, and organizations are finding them in the field of data visualization.

Advanced data visualization tools rapidly transform massive volumes of detailed transaction and customer data into easily interpreted, multi-dimensional pictures and animations that intuitively highlight specific areas for causal analysis. (See figure 1, page 34.)

"We're finding that data visualization really resonates in the marketplace today," says Susan Terry, Teradata's director of Business Intelligence and ISV Partnering Practice. "Businesses have continued to direct more and more data at their end users, many of whom don't have the time or the skills to take advantage of it. Visualization gives them a very graphic and intuitive way to present and explore data. It lets them glean insights very quickly, which is essential, because it's coming at them like the stream from a fire hose."

The evolution of visualization

The roots of data visualization stretch back to the first use of numerical tables in the second century with the first graphs a few centuries later. Beginning in the 17th century, rapid

advances in navigation, analytical geometry and statistical analysis drove increasing sophistication in the visual presentation of data.

With the widespread use of computers in the mid-20th century came the use of relational

databases, followed by spreadsheets and early BI tools that simplified multi-dimensional analysis. By the 1990s, these tools were beginning to acquire elementary graphing capabilities.

“One of the things that has enabled visual analysis to come into its own is the development of technology to generate visualizations automatically,” explains Bill Franks, a Teradata Professional Services Partner and advanced business analytics specialist. “Until powerful computers came into the mainstream, most visual representations of data had to be hand rendered and kept simple, which was very limiting. Then PC applications such as Excel and PowerPoint began acquiring basic graphing capabilities, but they only worked on data that was locked in place. You had to extract a specific data set and then produce a specific plot.”

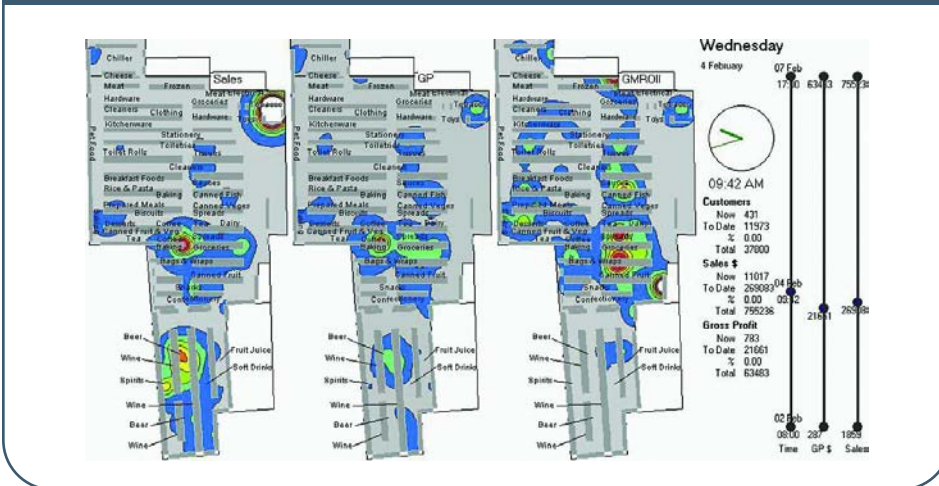
Generating visualizations automatically led to the development of management dashboards. Enterprise Workplace tools are personalized, role-based desktops that integrate multiple real-time information displays, key performance indicator (KPI) summaries and alerts in an easy-to-read format with direct drill paths into the full supporting detail and analytical capabilities of the enterprise data warehouse. That ability to drive real-time desktop visualization directly from a data warehouse is the hallmark of today’s advanced visualization tools.

“Now we have tools that can connect to many different data sources directly, bring in data dynamically, and display thousands or tens of thousands of data points in a graph,” Franks continues. “That’s what makes them really powerful. Now we’re not limited to whatever small amount of data we’ve pasted into a spreadsheet. We can set up a graph template, point the tool at a data source and have it display whatever it finds.”

Evaluating data visualization tools

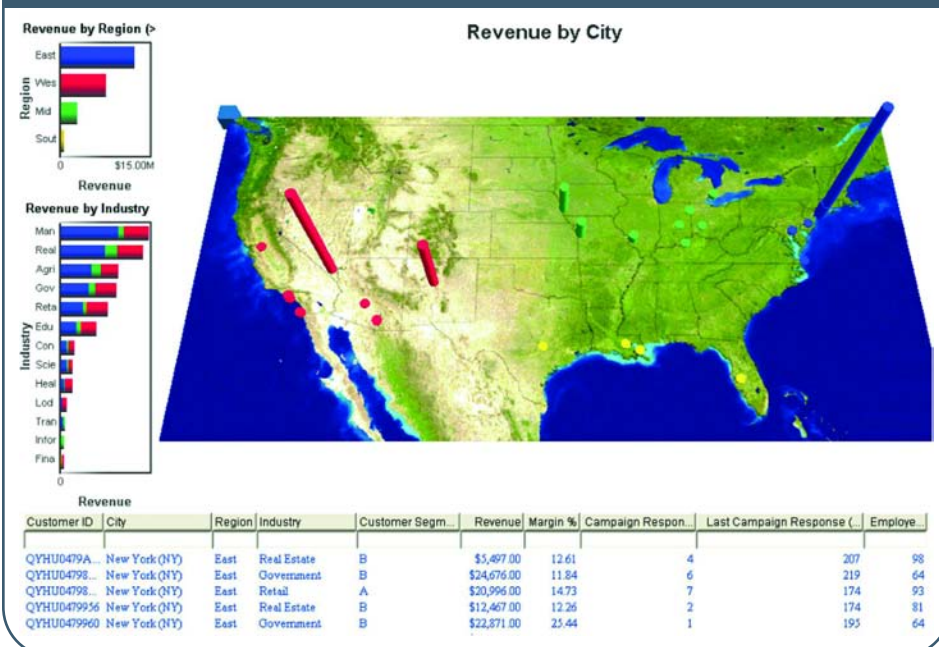
Data visualization allows organizations to support a wider range of business users and decision environments with rapid, intuitive insights from large, real-time data sets. How-

Figure 1 Advanced data visualization



More than 85% of an organization’s information is in unstructured data. Text analytics can reformat this data and merge it with traditional structured data for greater corporate insight.

Figure 2 Spatial display of information



ADVIZOR Visual Discovery provides detailed display and dashboards, such as this map presenting a dynamic visual representation of revenue by city.

ever, because the technology space is new and product development continues at a rapid pace, selecting the appropriate tool can be challenging. Terry and Franks offer several suggestions for prospective adopters who are evaluating tools and vendors.

Pick specific tools for specific purposes. “Visualization tools are not interchangeable,” says Terry. “The types of visualization techniques that are embedded in a particular tool

can make it more or less appropriate for certain users, and more or less effective in answering certain types of business questions. Some employ techniques that an advanced analytical user will find very easy to exploit and understand. Others tend toward spatial displays that can be very practical for location-specific data, or extremely simple, streamlined displays that are easy for operational users to apply in making quick decisions across broad data sets.

The power of visual analysis

Accordnig to rscheearch at Cmabrigde Uinervtisy, it deosn't mttae in waht oredr the ltteers in a wrod are, the only iprmoentn tihng is taht the frist and lsat ltteer be at the rghit plcae. The rset can be a total mse and you can siltl raed it wouthit a porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

Source: <http://www.mrc-cbu.cam.ac.uk/personal/matt.davis/Cmabrigde/>

Isn't it amazing how our minds are calibrated to sort through the clutter to interpret and make intelligent patterns from seeming chaos? This is but one example of why data visualization techniques, using computers and algorithms that can process incredible amounts of data more quickly, can help bring more transparency to the “mounds of data” being presented to users in easier and faster-to-interpret visual renderings.

—Susan Terry

Visualization: a growing market space

Data visualization makes a difference in many industry verticals:

- > A fast-growing U.S. regional bank competes effectively with much larger institutions. Analysts in the bank's finance and accounting units and front-line business users in more than 20 other departments use visualization to determine which products are growing fastest, where the most profitable customers are located, where revenues are increasing or declining, and how performance compares across territories.
- > A leading multinational pharmaceutical firm improves the productivity of its global R&D operations. Senior managers and more than 1,000 development team members use visual analytics for self-service analysis of project cost, scheduling, budget and resource allocation data. The result: faster development, lower costs and shorter time to market.
- > A major casino operator uses data visualization for predictive modeling of customer behavior. By tracking patterns of gaming activity, the firm is able to optimize the selection and physical location of slot machines on each of its gaming floors, resulting in a \$2 \$3 productivity increase per machine per day. With more than 42,000 machines installed in 26 different properties, the gain easily exceeds \$100,000 daily.
- > A major U.S. retailer provides role-based decision support in three key operating initiatives: point of sale (POS) productivity optimization, out-of-stock minimization and declining spender reclamation.

—B.T.

We think it will become very common to have multiple tools leveraged in an organization to address different types of questions and support different types of users.” (See figure 2, page 34.)

Put business insight closer to the enterprise edge. The value for data visualization lies in taking data out of the hands of a few back-office analysts and providing deep and rapid insight to a much broader group of front-line decision makers who are affecting business performance in minute-to-minute, “moment of truth” decisions.

Look for quick business insights, not pretty pictures. “It's important to remember that visualization isn't about a pretty display,” says Franks. “It's about helping you make better-informed decisions faster. There are products out there that create visually stunning displays that don't support rapid interpretation. A three-dimensional pyramid may be an arresting way to present data, but if it takes longer to interpret than a simple bar chart, it's counterproductive.”

Look for tools that leverage the data warehouse. The architecture of a visualization tool, particularly the resources that are available for heavy workloads, is a critical factor in its performance. Many of these products are server-side software, and their performance is constrained by server CPU and memory capacity. Other products are designed to leverage the execution resources of the data sources with which they interact. When that resource is a Teradata Warehouse, it can have a dramatic impact on visualization performance.

“Tools that can't take advantage of the analytical resources on the data warehouse platform may struggle with the data volumes, and response times may suffer,” Franks points out. “Many of these visualizations are going after very large data sets and rolling them up in a lot of different ways. Handling very large data sets is exactly what Teradata is built to do.” T

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