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Beyond the Spreadsheet

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A new generation of data visualization tools are reducing the reams of information involved in trading decisions to simple, visually striking patterns. Visual cues such as size, shape and color are used to alert traders to real-time trends in price, holdings, bid-order volume, cash at risk or any number of other factors.

Securities Industry News took a look at representative offerings from **Cantor Market Data**, Fractal Edge, Oculus, Panopticon Software and Visual Numerics at the Securities Industry Association Technology Management Conference and found that they share a common value proposition that is simplicity itself: usability on the front end and plug-and-play data connectivity on the back.

One of the most widely used visual models in use today derives from the "tree-mapping" design developed in 1991 by Ben Shneiderman, a professor of computer science at the University of Maryland, who presented new developments at an SIA conference session. Also known as "heat-mapping," for its resemblance to the way temperature bands are displayed as highly contrasting colors on weather maps, this simple screen design presents data graphically as squares of different sizes and colors, fit together in a sort of quilt pattern on a rectangular field. Think of it as a square pie chart in which size relationships can be grasped intuitively.

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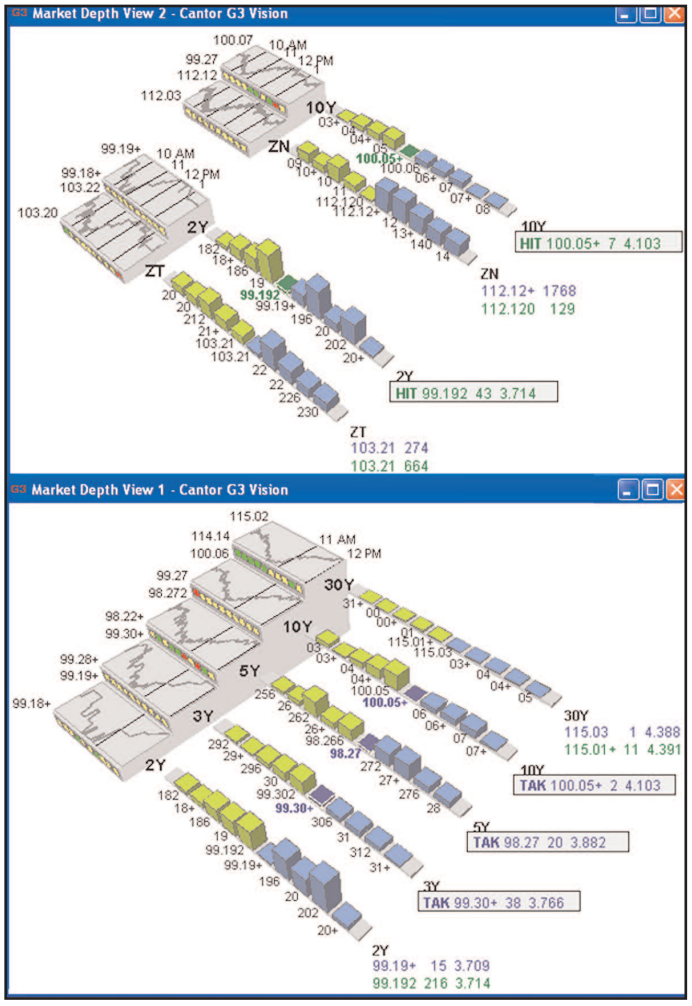
> *-Ben Shneiderman*

"My belief is stock traders are making suboptimal decisions because they deal with design that makes it very difficult for them to find the information they want," says Shneiderman. "They work with very difficult interfaces. So I'm trying to present a huge amount of information in a way that's not cluttered and chaotic, but meaningful, and makes sense, enabling them to spot outliers and trends."

The *Wall Street Journal* has been using this model for some time on its Web site to present an overview of the companies in a given industry and sector. SmartMoney.com uses its own version of tree-mapping to display "market maps" of thousands of stocks and funds.

Panopticon's tree-map interface combines the visual cues associated with color and size with point, click and rollover mouse behaviors that anyone who surfs the Web will immediately recognize. Users "zoom" to the level of detail required and reorganize the data according to various factors by clicking or rolling the cursor over the shapes. Simple pull-down menus offer various ways to filter on a single factor, such as market cap-



Market Depth of Treasuries and Futures together in a dynamic visual display

italization or price changes in a given sector, or to drill down to a specific security or measure desk performance.

Pioneer Investments, for example, uses Swedish firm Panopticon's heat-mapping interface for portfolio attribution and asset management. The customizable color scheme is designed to alert managers to price fluctuations or to signal whether a certain trading desk is making or losing money. JP Morgan, Citigroup and Bear Stearns also use the interface.

London-based rival Fractal Edge offers what it says is a superior visual model: a patented, circle-based interface that resembles the Venn diagrams used in set theory and taught to high school math students. Fractal offers its own set of Web-like mouse behaviors and visual transition effects. Like its peers, it comes with an adapter that supports a plug-and-play hookup to most databases. Credit Lyonnais Securities Asia (CLSA) provides the interface to clients for browsing proprietary research on growth forecasts and corporate earnings estimates.

In a demo for *Securities Industry News* on the floor of last week's conference, Fractal Edge general manager Scott Hall highlighted the risk-auditing features of the interface. Colors and shading were initially configured to show performance and profit loss for a particular person or specific desk during trading. Selecting a filter from a pull-down menu shifted the view to risk indicators. In one potential trouble zone, for example, net profit was flat but market exposure was high. Individual traders and managers have the interface on their desktops, and it can also be deployed on an oversized plasma-screen "wall board," providing the floor with a common view of the market and the positions currently being worked.

Ameritrade offers a somewhat similar tool on its Web site to help users monitor liquidity in real time, but Hall says the difference is not the circular design—which some critics think wastes screen real estate—but the way the Venn diagram concepts allows multiple levels of the data hierarchy to be viewed at once, which eases transitions from one level to another and helps keep the user oriented as she zooms through the data structure.

Cantor Market Data demonstrated a data visualization interface, G3 Vision, which resembles the result of projecting Microsoft's charting engine for Excel into the futuristic "haptic" interfaces shown in the sci-fi movie *Minority Report*. Sets of three-dimensional bar graphs pulsate up and down as prices and bid offers fluctuate on cash and futures for two-year, three-year, five-year, ten-year and thirty-year Treasuries. Portfolio or desk managers can look at each stack's size and color to gauge where the market is heading.

CANTOR MARKET DATA DEMONSTRATED A DATA VISUALIZATION INTERFACE, G3 VISION, WHICH RESEMBLES THE RESULT OF PROJECTING MICROSOFT'S CHARTING ENGINE FOR EXCEL INTO THE FUTURISTIC "HAPTIC" INTERFACES SHOWN IN THE SCI-FI MOVIE MINORITY REPORT.

Columns in the center of the G3 display represent best bid and offer; the shading of the bars, from saturated color to faded color, indicates participation levels. Mousing over the three-dimensional bars triggers pop-up boxes with last-trade price and other details, such as volume, yield and size. Goldman Sachs and Bank of America are currently using G3, which gets its data from eSpeed, the electronic interdealer bond trading subsidiary of Cantor Fitzgerald.

Cantor's marketing staff says that the firm's own experience with G3 shows that it speeds the development of novice traders into professionals by eliminating much of the time spent scanning columns and numbers in search of patterns. In fact, all the vendors report training cycles measured in hours or minutes. As a Panopticon executive said, "If the user needs a manual, we've failed in our purpose." ■