

TRADING  
TECHNOLOGY



# Strange Tools

Cognitive science and simulated instruments are having an impact on everyone from JPMorgan Chase to wealth managers as new technologies gain credibility and take hold of the trading floors.

By PHILIP CRAIG



**I**n the 1960s, the research wing of the US Department of Defense reportedly considered developing a robotic elephant to fight in Vietnam. The project was canned, but unusual technologies have continued to amaze and amuse ever since. Look no further than your Web browser. The Internet, once a pipe dream, is now an essential factor in many lives and businesses.

In 2005, even trading floors aren't free from unexpected and unusual innovations. There are no mechanical elephants, but heat maps, sweet sounds and glowing orbs can now be found on trading desks. The military hasn't handed over its technology to the highest bidder, but there are unusual changes to be seen as banks look for new ways to help their troopers on the front lines. Three innovative vendor firms have aimed their tools at a trader's central demand—the need to monitor market movements.

Swedish firm Panopticon offers one such product. The Heat Mapping Toolkit lets users create visual heat maps to monitor data. Based on research by Ben Schneiderman, a professor at the University of Maryland in the 1980s, a heat map divides a computer screen into areas represent-

ing different groups of data, offering a birds-eye view of a bank's data while letting the user drill down through the areas to specific reports and analytics. Rather than offering the streams of figures that a trader is used to, the tool uses the color, size and proximity of the different areas to visualize the underlying data.

According to Willem De Geer, Panopticon's CEO, the firm has seen a 200 percent increase in the numbers of users of its heat map technology. His estimate stands at 60,000 users by

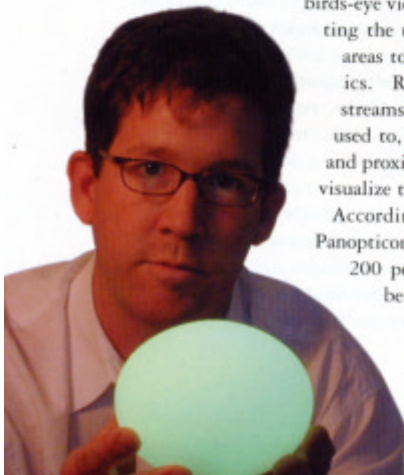
the end of last year, compared to around 18,000 users for 2003. "Heat maps are far simpler than most data visualization tools, and are very addictive," he says.

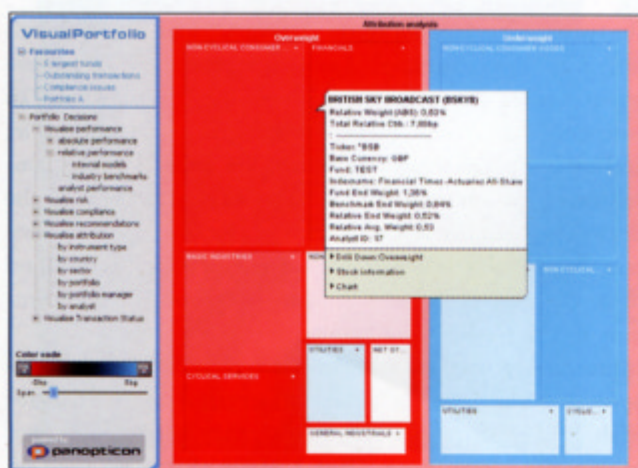
Just ask Tom Troscianko, a vision scientist in the neuroscience department at Bristol University in England. Skeptics should look at the research that backs up the principles behind heat maps, he explains. "Information about color is used by human vision to understand the properties of large areas," says Troscianko. "If you are trying to compare data and understand it as a whole, it is very difficult to watch a number of graphs simultaneously. But using colored areas allows you to monitor a number of positions at once."

Nothing will replace the specific and detailed data offered by a line graph or straight figures, but the heat map is an easier way to monitor information as a whole, he explains.

Panopticon's heat maps have been built into Web sites, intranets and standalone applications to help with managing portfolios and equity research. US bank JPMorgan Chase (JPMC) used Panopticon's heat maps to create its own Credit Map product. The tool, used by its European credit departments and external clients, allows users to monitor positions and movements within relevant markets based on JPMC's own data. "Our researchers looked at the heat map technology and suggested we industrialize it," says an official at the bank, who requested anonymity. "It only took two months to get Credit Map onto our screens after that."

Credit Map has been on the market for two years, but its popularity among its users has encouraged JPMC to continue developing the tool. Clients of the bank can now use Credit Map through a Reuters terminal to examine their portfolios, and the bank aims to extend the tool's coverage, adding new asset classes to its scope. Officials have declined to say which asset classes the tool will cover, but they are slated to be added later this year.





### Music Alerts the Savage Trader

While the heat map uses computer screens, Hanover, N.H.-based vendor Accentus encourages traders to use another physical sense entirely. The firm's Auditory Display technology means that music on the trading floor need no longer be an unwelcome distraction. A trader's penchant for Snoop Dogg or The Beastie Boys will remain unheard on most floors, but Accentus' product lets traders keep an ear on the markets through simulated musical instruments.

Paul Calvetti is managing director and head of proprietary trading at Barclays in New York, and has been using the technology for over six months. Given the near-infinite number of variables that can affect the price of any one asset, the software helps him to monitor the markets, he says. He has linked the Accentus software to several important assets: "For instance, I have the piano tied to the S&P 500," he says. "If the piano plays a high note, I know that the S&P 500 just ticked up, and I know what the effect will be on the interest rate and so on."

Accentus is an offshoot from Ivy League brain factory Dartmouth College. "The research is not new, but it's the first time it has been used in a commercial application," says James Perkins, CEO of Accentus. Like any Ivy Leaguer, Perkins is keen to point out the academic pedigree of Accentus' creative team. The founder and CTO is Edward Childs, a musician who plays five instruments and has five degrees under his belt, including a PhD in computational fluid dynamics. Perkins also hints at military uses for this "augmented cognition," such as classified projects to use principles related to the Auditory Display in fighter jets.

The idea of musical cues is a sound one, says Stephen Brewster, a professor in the University of Glasgow's department of computer science, and a specialist in audio interaction. His research involves the development of systems that use alternative interfaces for users, and he believes that the principles behind Accentus may have merit. "Listening to

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says LOUIS CROSIER, a principal at New York asset manager Windward Investment Management.

information allows you to process it differently," he explains. Watching figures on a screen or listening to a synthesized voice reading out prices are more effective ways to get the absolute values in a market, but "listening to market movements in a system like Accentus lets you appreciate the shape and direction of the data much more easily," says Brewster.

What will all the noise mean for others on the trading floor? Perkins says that many traders already use squawk-boxes with added subwoofers for sound quality, but adds, "we're not talking a U2 concert here." In some tests, playing continuous music that changes with the markets has worked, and Perkins boasts that passers-by have overheard the sounds and asked for a CD of the music. However, the current software plays what Perkins calls "discreet sonification." "The system plays fragments of music with changes in data," Perkins explains.

Barclays' Calvetti says he doesn't find the system disruptive. He is currently the only trader to use Accentus on his floor at Barclays, but he turns up the volume for his colleagues on his trading desk. "I've been using it for around six months now, and they find it helpful," says Calvetti. "It took a few days to learn how it worked and what the sounds mean. It's useful, so it's easy to learn it fast."

Calvetti finds the tool so useful that he believes Accentus' technology will become ubiquitous across trading floors within the next five years.

### The Glowing Indicator

While Accentus and Panopticon can dream of applications of their technologies beyond financial services, Cambridge,



Willem De Geer

Mass. firm Ambient already offers its products to the retail market. Founded by researchers from the Massachusetts Institute of Technology (MIT), Ambient's devices sit on your desk or bedside table and are continuously updated via a wireless network.

The Ambient Orb, a hollow ball of frosted glass, has been described as a giant mood ring, gauging the data of your choice. For traders and financiers, the appeal is that the Orb promises to track any equities or portfolios you ask for. The Orb is initially set to track the Dow Jones Industrial Average, and it glows increasingly greener or redder to indicate market movement up or down, or yellow when the market is calm. For no extra fee, the Orb can be customized to track a different set of data, including, for example, other market indices, the weather or pollen counts. The user also has the option to upgrade to access premium channels, including a customized portfolio.

Co-founder of Ambient, David Rose, teaches a course on information visualization at Harvard University, and echoes

the principles behind both Accentus' and Panopticon's offerings as he describes Ambient's products. "Cognitive scientists talk of pre-attentive processing," he explains. "In your peripheral vision, you can process the size, color, angle, and other characteristics of something even if you're concentrating on something else." The inspiration behind the devices was simple favorites such as clocks and thermometers, he explains. Despite the advent of the Internet and more complex tools, such simple, useful objects are common to practically every home.

Information overload was also a driver in Ambient's development. "Users in the financial services might disagree with Ambient's philosophy, saying they need details, not generalities," says Rose. "But I argue that they need an overview before they can decide which details to look at."

Louis Crosier, a principal at New York asset manager Windward Investment Management, concedes that traders are going to have access to most of the data they need through their screens, but he sees the Orb as more than a pretty bauble. "There is so much information to monitor that traders can miss things," he says. "It can be handy to have a huge ball glowing red in the corner of your eye. It's easier to notice than a figure changing on the screen in front of you." Crosier plans to install five of the Orbs in his office to illustrate different market movements.

While the retail market has been surprisingly willing to shell out \$150 for one of the shining globes, Ambient's Executive Dashboard could be of greater use to traders and the color-blind. Three dials, much like speedometers, can measure the performance of variables such as the S&P 500. Unlike the Orb, the dials can point to specific figures and monitor three variables simultaneously. Crosier is enthusiastic about the Dashboard, too. "Dials and colors are far more effective as attention-grabbers than moving numbers," he says, but he admits that salespeople will find the Dashboard more useful than hardcore traders will.

Panopticon, Accentus and Ambient may have the academic credentials and case studies to back up their technologies, but will institutional investment firms shell out their IT dollars for such peripheral, counterintuitive technologies? Panopticon, with its estimated 60,000 users and a high-profile bank as a client, has already been making waves.

Accentus is small and working on gaining market awareness, but Calveti of Barclays believes that its marketing strategy will pay off. "The way to market a tool for traders is not to go to the institutional level at first. If you approach traders and trading desks individually, once a lot of traders start approaching their superiors and asking for money to buy the system, that's when institutions will start looking to buy enterprise-wide licenses," he explains. ●