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Visual I/O Brings Your Data to Life Through Visual Experimentation

Wade Roush, 7/25/08

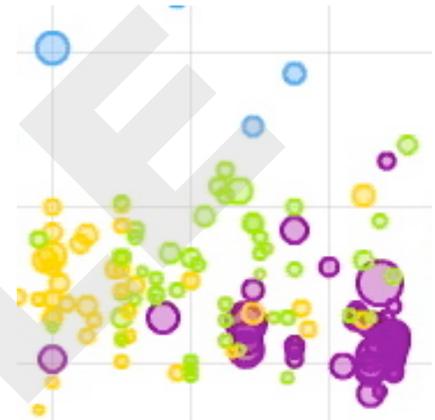
In February 2006, Swedish physician, statistician, and global health expert Hans Rosling brought down the house at TED (the Technology, Entertainment, and Design conference in Monterey, CA) with a presentation on health and economic trends in developing nations. But it wasn't the content of the presentation so much as the software he was using that grabbed the audience: called Trendalyzer, the program converted Rosling's data into colorful animated graphs. By representing countries as dots of varying size that moved against the x and y axes over time, Trendalyzer brought vivid life to changes such as the last century's general improvements in income and life expectancy—and highlighted how health and wealth in once-lagging regions such as Asia have surged ahead, while they have improved much more slowly in areas such as sub-Saharan Africa.

To many in the audience (and to me, when I watched the online video of Rosling's TED talk), the Trendalyzer presentation was a revelation, seemingly heralding a new era in which clever design choices coupled with serious graphics-processing power would cause all sorts of interesting trends in complex data to leap out at com-

puter users. Indeed, the next year, Google announced that it had acquired the Trendalyzer software from Rosling's non-profit Gapminder Foundation, saying that it hoped to improve and expand Trendalyzer and make it "freely available to any and all users capable of thinking outside the X and Y axes." Unfortunately, like many other early-stage technologies that get anointed by the massive buzz amplifier that is TED, Trendalyzer has since receded from view. Google hasn't done much with the software, beyond making a Trendalyzer-like gadget called "Motion-Chart" available as part of Google Spreadsheets.

Meanwhile, there's a company in Newton, MA, that has spent the better part of this decade quietly applying many of the same design principles behind Trendalyzer to business problems—and selling its software, to boot. It's called Visual I/O, and I spent some time recently learning about the company's remarkably beautiful Web-based business analytics software, called DecisionIris, from company co-founder, president, and CEO Angela Shen-Hsieh.

Now, that's probably the first time I've ever used "beautiful" and



"business analytics software" in the same sentence. While Visual I/O markets DecisionIris as a business intelligence tool, and making sense of complex business data is certainly one of its strengths, it would be grossly unfair to lump the program in with the kinds of graphical tools offered by traditional business intelligence companies like SAP and Cognos, which are closer to the primitive chart wizards in Microsoft Excel than to anything a professional information designer might conceive. If you're an aficionado of the work of Yale information designer Edward Tufte—author of *The Visual Display of Quantitative Information* and *Visual Explanations* and the man the *New York Times* has described as "the da Vinci of data"—then you will immediately feel at home with the way DecisionIris represents logical relation-



ships and changes over time, and with the innate sense of color and proportion built into the software.

I'm gushing, I know, but bear with me. The program's beauty is undoubtedly traceable to the fact that Shen-Hsieh and her fellow co-founder Mark Schindler are both Harvard-trained architects, not software engineers. The pair created Visual I/O as a spinoff of Chicago-based consulting firm Schindler + Associates (where Mark was a partner) in 2002; they wanted to take the visualization software the firm had created to help clients such as pharmaceutical companies get a high-level view of their data and turn it into a commercial product.

Shen-Hsieh (pronounced "shen-shay") and Schindler felt sure that there was a larger market for software that would help business managers visualize data more flexibly—

switching between space-based and time-based representations, for example—depending on the kinds of insights being sought. After all, why go the trouble of collecting terabytes of data about a company's performance and assembling it into huge, expensive databases and data warehouses if you can't play with it at will? "If you look at the history of information technology, so much of it is focused on storing and accessing data," Shen-Hsieh says. "We focus in the last 18 inches—from the screen to the brain. We're about the cognitive piece."

Since a picture equals one kiloword, I'll refer you at this point to the picture above. It's a screenshot from a demo Shen-Hsieh walked me through, based on real data about residential properties for sale in the Boston suburbs of Brookline, Newton, Waltham, and Watertown. It illustrates how Deci-

sionIris can help users draw meaning from a mess of data by bringing out multiple dimensions of the data simultaneously; an example about real estate seems easier for most people to relate to than heavy business analytics.

Each dot in the chart represents a house. The size of the dot represents the house's asking price, and its color shows which town it's in—Brookline is purple, Newton is blue, Waltham is green, and Watertown is yellow. The horizontal axis indicates the year the house was built, and the vertical axis indicates its square footage. (Notice how that's already four dimensions of data, packed into a type of graph usually used for no more than two dimensions.)

What observations can be drawn from the chart? Well, right away, it's obvious that houses for sale in Newton are older, bigger, and more expensive than houses in the other cities. That makes sense, given that Newton (where Visual I/O happens to be located) was one of Boston's first major suburbs, and is still home to lots of fancy spreads on large properties. Properties in Watertown are also on the older side, mostly built between 1860 and 1950, but are much smaller—which, again, fits with that city's working-class history as the home of a major nineteenth-century armory. In Waltham, most of the houses are between 1,000 and 2,500 square feet, and were built between 1945 and 1970—reflecting that city's history as one of the many suburbs where lots of ranch-type

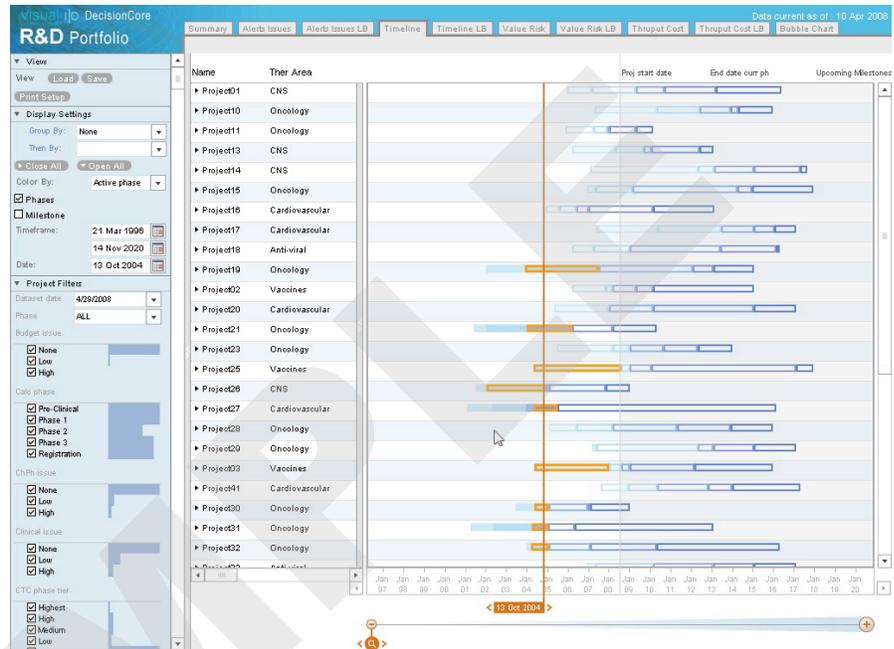
housing sprang up right after World War II. Finally, there's Brookline, which has lots of very small but very new and very expensive housing—a legacy of the wave of high-end condominiums built in that town from 1980 onward.

If you examine the left side of the screen shot, you'll see a few of the tools DecisionIris provides to users who want to try out different views of a dataset. As Shen-Hsieh and Crawley showed me in two separate demos, the software makes it possible to filter data along any dimension, or all of them at once. So, for example, if you were house-shopping and you were only interested in properties with at least two bedrooms built after 1960 and costing no more than \$1 million, you could move a few sliders and check or uncheck a few boxes and watch while the graph instantly responds, showing which cities offer the most choices fitting your criteria. (Looks like you're headed to Waltham, in this case.) By mousing over an individual dot, you can get a pop-up window giving you the address and price of that particular house—yet more data packed into a single view.

In the real estate example, it's obvious how DecisionIris can, in a single view, convey insights that would take hours to arrive at if you were limited to the narrow, fussy, and largely-text based search interfaces available at most online property-search databases. But the housing data is only one illustration of what Visual I/O's software can do. Most of the company's actual clients are in healthcare and pharma-

ceutical companies like Merck and Johnson & Johnson, who use the timeline-based views available in DecisionIris to get a handle on things like product development life cycles. (See the chart below.)

previous example. But equally important, you can derive such insights by playing with the data in real-time, rather than relying on staff analysts to create big, ponderous, static PowerPoint presenta-



I don't have time or space to describe the examples that Shen-Hsieh and Crawley showed me; suffice it to say that if you're a drug company and you have 17 potential products in the works, DecisionIris can help you determine things like whether they'll be hitting the market in a reasonably distributed manner, or whether you'll have long drought years between rollouts. Based on that, you can examine how many people and how much money you're putting toward each product, and reprioritize if necessary. Problems and issues jump out at you, just the way the real estate trends do in the

tions, which inherently limit the kinds of questions that executives bother to ask.

Ultimately, it's all about visual experimentation—a combination of play and serious thought. "Architecture involves the left and right brain merging," as Shen-Hsieh puts it. "First you have to understand how people are going to experience a space or an object, then translate that into how it's going to be built. That is the same approach we take to visualization."

Visual I/O collected its one and only round of venture financing

from Switzerland-based Logispring in 2006, and has 20 employees. Shen-Hsieh says that awareness of DecisionIris is spreading fast in the life sciences industry—revenues should double this year—and that company engineers are thinking about how to apply the visualization tools to other industries.

After Shen-Hsieh's visit, I requested a more detailed demo of DecisionIris, which was graciously provided via Web meeting by John Crawley, a senior solutions engineer at the company. Before we finished, I asked Crawley—a Brit

who has been with Visual I/O for about a year—what had attracted him to the company.

“I come from the world of databases and systems, but I have somewhat of a natural flair for artistic things,” Crawley says. “When I first talked to Mark and Angela about the way they use things like color schemes to communicate hidden information, it was the first time I'd ever come across a business intelligence company that actually pays attention to the aesthetics. Most companies I've worked for are very focused on ‘whacking and stacking’

the data. But Mark and Angela think in ways that, I dare say, most business intelligence companies are simply unable to think.”

Which goes straight back to the founders' training as architects. Despite years spent working with software developers and database engineers, Shen-Hsieh says she's still an conceptual artist at heart. “But my medium is commerce, not paint or plaster,” she says. “It's all about, how can you find new ways to utilize visual and experiential media to communicate ideas, concepts, information, and data.” ■

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