Dashboard Design: Taking a Metaphor Too Far
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Visual metaphors based on familiar objects and activities often serve as the design theme for software interfaces. The Windows and Mac operating systems both use the metaphor of a desktop for their user interfaces. Interaction with their file systems involves objects that are common in the workplace, including file cabinets, folders and trash cans. A good visual metaphor in this context provides the user with an immediate understanding of how the software works based on existing knowledge of something already familiar, resulting in a reduced learning curve. Once you've learned how to use the software, however, the metaphor rarely continues to matter. From that point on, all that matter are the merits of the interface for effective and efficient use.

The business intelligence (BI) dashboard is a striking example of software that uses a visual metaphor. The dashboard of a car, given its familiarity, is a fitting visual design model for software that displays the information you must easily and efficiently monitor to do your job and achieve your objectives. Most meters, gauges and traffic lights that exist in virtually every dashboard product can be understood with little instruction. That's the advantage—the only advantage—of the dashboard metaphor. The joy of being greeted by those cute display widgets on the first day that you use your dashboard, however, wears off after a few days, and what you're left with is a dashboard filled with gadgets that are just plain annoying and a poor use of valuable screen space. I think most software vendors have taken the dashboard metaphor much too far.

Before proceeding, let's make sure we share a common understanding of what a dashboard is. Here's a definition that I introduced about a year ago: *A dashboard is a visual display of the most important information needed to achieve one or more objectives, consolidated and arranged on a single screen so the information can be monitored at a glance.*

The essential characteristic of a dashboard is that it displays information on a single screen and does so in a way that allows you to monitor that information—getting what you need from it—quickly and easily. This might sound simple, but I assure you it is not. The ability to make a screen full of information instantly understandable is a grand achievement of elegant design. It requires visual design skills that are far from common and software with display widgets that are intentionally and expertly designed to work well on a dashboard. Most dashboard vendors have focused on coming up with the cutest and most realistic looking meters, gauges and traffic lights possible, rather than seriously considering the unique opportunities and design challenges of dashboards to produce immediate insight. They've forgotten that the goal of a dashboard—the only goal—is communication.

This superficial focus of vendors is not sinister; it is the result of their desire to compete successfully by giving their customers what they think their customers want. However,

customers that have only seen the gadget-centric monstrosities that dashboard vendors promote on their Web sites rarely see past the flash and dazzle. They trust that the vendors have done their homework and are promoting what customers really need. Customers are expert in knowing the business results that they need to achieve but not in determining how technology should be designed to help them achieve those results. Software companies must bring this expertise to the process. In his wonderful book entitled, *The Inmates Are Running the Asylum,* design guru Alan Cooper writes:

> *The sad thing about dancing bearware [Cooper's term for poorly designed software that is difficult to use] is that most people are quite satisfied with the lumbering beast. Only when they see some real dancing do they begin to suspect that there is a world beyond ursine shuffling. So few software-based products have exhibited any real dancing ability that most people are honestly unaware that things could be better—a lot better.*[1]

Let me illustrate. Figure 1 shows some meters that appear on a sample dashboard from Infommersion. I chose this particular example not because it is unusually poor but because even though the meters are nicely rendered, they communicate poorly and waste a lot of valuable space.

Figure 1: Re-Creation of Dashboard Gauges from Infommersion

These meters fail in their mission to communicate. The quantitative scales on the meters aren't labeled, so the graphics in and of themselves don't reveal the values. For example, only the text tells us that the value of the middle meter is 7,822 year-to-date units. By studying all three meters, you soon discover that the green color of the needle must indicate that 7,822 units is good—unless you are color-blind, that is. The approximately 10 percent of males and 1 percent of females who cannot distinguish green from red are out of luck. Given this problem, can you assume that the value is good because the needle is pointing more to the right than the left? Apparently not, judging from the Returns Rate meter. Therefore, assuming you're not color-blind, the middle meter reveals the following information in total: the value of year-to-date units is 7,822 and that is good. Not a lot of information, especially for the amount of space that was used to display it. Wouldn't it be helpful to also see 7,822 units in context, such as compared to a target or in relation to history, and to know not just that this value is good, but how good it is?

Despite how nice it looks, the effort to make these meters look realistic using shading and the reflective sheen of light on a polished surface actually undermines their ability to communicate. These details add visual noise that is distracting and meaningless—useful for a video game, not for a BI dashboard. Research regarding the role of graphics in learning has shown that simple line drawings are a more effective form of communication than photographs and other detailed illustrations for most communication tasks because they show only what's needed—what's relevant to the task—thereby reducing the time and cognitive resources required to process the information. (See: *Graphics for Learning*, Ruth Colvin Clark and Chopeta Lyons, San Francisco: Pfeiffer, 2004.)

It is always important when using graphics to communicate business information to reduce the display as much as possible to the actual data, minus the visual fluff, but it is especially important to do so on a dashboard. The purpose of a dashboard is to communicate a rich and often dense assortment of information in an instant. There is no place for useless content through which our eyes and brains must sort. To achieve this, what people see on a dashboard must be the result of thoughtful and skillful design using display widgets that were specifically designed to work well on a dashboard. These display widgets must be capable of communicating a rich set of information in a small amount of space with exceptional clarity. Next time you talk to your dashboard vendor, ignore the sizzle and tell them that this is what you need.

Reference:

Cooper, Alan. *The Inmates are Running the Asylum.* Indianapolis: SAMS Publishing, 1999. p.59.

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About the Author

Stephen Few has worked for over 20 years as an IT innovator, consultant, and teacher. Today, as Principal of the consultancy Perceptual Edge, Stephen focuses on data visualization for analyzing and communicating quantitative business information. He provides training and consulting services, writes the monthly *Visual Business Intelligence Newsletter*, speaks frequently at conferences, and teaches in the MBA program at the University of California, Berkeley. He is the author of two books: *Show Me the Numbers: Designing Tables and Graphs to Enlighten* and *Information Dashboard Design: The Effective Visual Communication of Data*. You can learn more about Stephen's work and access an entire library of articles at www.perceptualedge.com. Between articles, you can read Stephen's thoughts on the industry in his blog.