Why Most Dashboards Fail

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Rise of the Dashboard

Dashboards can provide a powerful solution to information overload, but only when they are properly designed. Most dashboards that are used in businesses today fail. At best they deliver only a fraction of the insight that is needed to monitor the business. This is a travesty, because effective dashboard design can be achieved by following a small set of visual design principles that can be easily learned.

graphical luster, despite the fact that displays of this type usually say little, and what they manage to say, they say poorly. Only those who cut through the hype and learn practical dashboard design skills will produce dashboards that actually work.

Several circumstances have recently merged to allow dashboards to bring real value to the workplace. These circumstances include technologies such as high-resolution graphics, emphasis since the 1990s on performance management and

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Let me back up a little and put this in context. Few phenomena characterize our time more uniquely and pervasively than the rapid rise and influence of information technologies. These technologies have unleashed a tsunami of data that rolls over and flattens us in its wake. Taming this beast has become a primary goal of the information industry. One tool that has emerged from this effort in recent years is the dashboard. This single-screen display of the most important information needed to do a job, designed for rapid monitoring, is a powerful new medium of data presentation. At least it can be, but only when properly designed. Most dashboards that are used in business today, however, fall far short of their potential.

metrics, and a growing recognition of visual perception as a powerful channel for information acquisition and comprehension. Dashboards offer a unique solution to the problem of information overload, not a complete solution by any means, but one that can help a lot. Much of the problem can be traced back to the vendors that develop and sell dashboard products. They work hard to make their dashboards shimmy with sex appeal. They taunt, "You don't want to be the only company in your neighborhood without one, do you?" They whisper sweetly, "Still haven't achieved the expected return on investment (ROI) from your expensive data warehouse? Just stick a dashboard in front of it and watch the money pour in." Those gauges, meters, and

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The root of the problem is not technology—at least not primarily—but poor data presentation. To serve their purpose and fulfill their potential, dashboards must display a dense array of information in a small amount of space in a manner that communicates clearly and immediately. This requires design that taps into and leverages the power of visual perception and the human brain to sense and process several chunks of information rapidly. This can only be achieved when the visual design of dashboards is central to the development process and is informed by a solid understanding of visual perception and human cognition—what works, what doesn't, and why. No technology can do this for you. Someone must bring design expertise to the process.

Dashboards are unique in several exciting and useful ways, but despite the hype surrounding them, surprisingly few present information effectively. People believe that dashboards must look flashy, filled with eye-catching gauges and charts, sizzling with

traffic lights are so damn cute, but their appeal is only skin deep. Rather than creating a demand for superficial flash, vendors ought to be learning from the vast body of information visualization research that already exists, and then developing and selling tools that actually work. Rest assured that beyond the hype and sizzle lives a unique and effective solution to a very real need for information. This is the dashboard that deserves to live on your screen.

The Dashboard Design Challenge

The fundamental challenge of dashboard design is to display all the required information on a single screen:

- clearly and without distraction
- in a manner that can be quickly examined and understood

Think about the cockpit of a commercial jet. Years of effort went into its design to enable the pilot to see what's going on at a

glance, even though there is much information to monitor. Every time I board a plane, I'm grateful that knowledgeable designers worked hard to present this information effectively. Similar care is needed for the design of our dashboards. This is a science that few of those responsible for creating dashboards have studied.

The process of visual monitoring involves a series of sequential steps that the dashboard should be designed to support. The user should begin by getting an overview of what's going on and quickly identifying what needs attention. Next, the user should look more closely at each of those areas that need attention to be able to understand them well enough to determine if something should be done about them. Lastly, if additional details are needed to complete the user's understanding before deciding how to respond, the dashboard should serve as a seamless launch pad to that information, and perhaps even provide the means to initiate automated responses, such as sending emails to those who should take action.

good or bad? Are we on track? Is this better than before? The right context for the key measures makes the difference between numbers that just sit there on the screen and those that enlighten and inspire action.

Quantitative scales on a graphic, such as those suggested by the tick marks around these gauges, are meant to help us interpret the measures, but they can only do so when scales are labeled with numbers, which these gauges lack. Many of the visual attributes of these gauges, including the eye-catching lighting effects that are used to make them look like real gauges, tell us nothing whatsoever.

Now take a look at an example below, taken from a small section of a dashboard that I designed. It includes methods of display that are probably unfamiliar, so let me take a moment to introduce them to you. The lines in the column labeled "Past 12 months" are called *sparklines*. They enhance what is often displayed using trend arrows by actually showing changes through

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Clearly presenting everything on a single screen requires a careful design and conscious planning; even the slightest lack of organization will result in a confusing mess. You must condense the information, you must include only what you absolutely need, and you must use display media that can be easily read and understood. Most dashboard software features display media that "look marvelous" but communicate little. If the information you need is obscured by visual fluff or is delivered in fragments, the dashboard fails. Anything that doesn't add meaning to the data must be thrown out, especially those flashy visual effects that have become so popular despite their undermining affect on communication. Elegance in communication is often achieved through simplicity of design. This is certainly true of dashboards.

Seeing Is Believing

Rather than trying to convince you with words, let me show you what I mean. Here is a series of three gauges, which I extracted from a sample dashboard that was created using the most popular dashboard product available today:

Let's focus only on the center gauge for a moment. If you relied on this gauge to monitor the current state of quarter-to-date sales, the value 7,822 YTD units, without additional context would tell you little. Compared to what? Assuming that you understand that a green needle on the gauge means that this value is good (and you are not color blind, which 10% of men and 1% of women are), your next question ought to be, how

time in the ups and downs of a line—in this case 12 months of data. They provide historical context for what's happening now. The small charts in the "% of Target" column are called *bullet graphs*. I created these to replace the gauges and meters that are typically used in dashboards with a richer form of display that requires much less space. The prominent horizontal bar is the metric, the small vertical line is a comparative measure (a target in this case), and the varying intensities of gray in the background indicate the qualitative states of poor, satisfactory, and good. The small red icon that appears next to Profit makes it easy to spot this item, which urgently needs your attention. Because no colors other than blacks and grays appear anywhere in the display other than the red icon, nothing distracts you from quickly finding what needs your attention most, with nothing more than a glance.
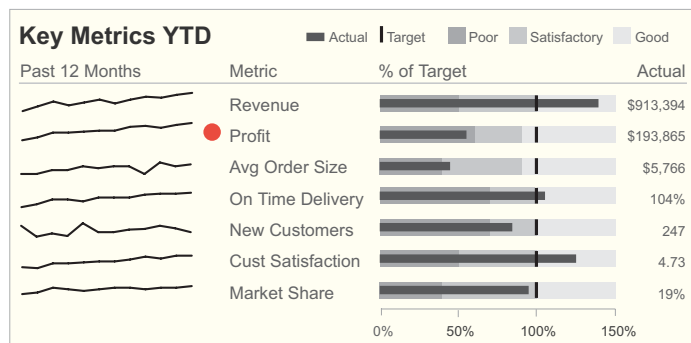
Rather than only three metrics, which appear in the previous example, this example displays seven key metrics, and each has been enriched with historical context and compared to performance targets, all in roughly the same amount of space. I hope that this single is enough to show that there is a world of difference between dashboards that look flashy and those that give you the information that you need at a glance. For the full story, I invite you to read my book, *Information Dashboard Design: The Effective Visual Communication of Data*, or to visit my website at www.PerceptualEdge.com.