



Discovering the Source of Business Intelligence Within

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At this point in its development, business intelligence is bursting with the awkward enthusiasm of adolescence. It must still mature in many ways as it travels along the road toward the land of Oz that it has long promised, but too seldom delivered. Business intelligence has a strong and athletic, yet still gangly body—fascinating to watch as it flexes and preens—but its mind is still undisciplined and often distracted by senseless activity. Much like a parent and their rebellious teenager, we must sit business intelligence down and talk about its future and the dangers of frivolity.

While I've been involved in business intelligence and data warehousing for about 10 years, my work in IT began long ago. I started working in the industry when the PC was brand new and anyone who knew anything about that little machine was considered an expert. A great deal has changed since those early days of the information age. The PC has altered the landscape of business in countless ways, including many subtle ways that we rarely notice. For most business people today, computer skills are required. In fact, knowing how to use a computer has insidiously begun to replace the fundamental skills actually needed to do one's job.

Along with the computerization of business, a cultural shift has occurred. This shift fosters the notion that computers are intelligent and do much of the necessary work. Over the last 20 years, we started believing that knowing how to use software that was developed to support a particular job is the same as knowing how to do the job. This idea, however, is not always the case. But knowing how to use Excel does not make you a data analyst and knowing how to use PowerPoint does not necessarily make you a communicator. Especially in the business intelligence domain, computers can only help us do more accurately and quickly what we already know how to do ourselves. If we lack the job's basic skills (such as analysis and communication), we'll never make good use of the software.

Business intelligence is about making sense of business information and then communicating one's findings to those who need them to make intelligent decisions. The value of business intelligence technologies should be judged by how effectively they support clear and accurate understanding and communication. The "intelligence" of business intelligence resides in people, not machines.

This industry has already accomplished some amazing things. We can now gather, store and access huge volumes of data at high speeds. Business intelligence has played a key role in parenting the information age. Now we're buried in information that frequently goes to waste. Our ability to use this information hasn't kept pace with our ability to amass it. Business intelligence must now shift much of its focus away from technology to effectively engage and support human intelligence. This will fulfill the basic reason for business intelligence.

When judged from this perspective, how well is business intelligence doing? This is an important question that we need to start seriously considering.

To help business intelligence move from adolescence to young adulthood, there are a few areas that deserve more attention. These areas include:

- The interaction between technology and the people who use it.
- What really works to promote understanding and communication.
- The human skills needed to derive value from data.
- The everyday business people who do the bulk of the work, not just a cadre of specialists.

Though these aren't the only aspects of business intelligence that demand our attention, thus far they have definitely suffered from too little.

The intermediary between business intelligence technologies and the people who use them is the computer screen. This projects information as an arrangement of pixels—meaningfully organized particles of light that enter our awareness through our eyes. How information is visually packaged makes the difference between understanding and ignorance (and sometimes even total misunderstanding). To successfully pass through the gates of awareness, information must be presented by business intelligence software in ways that match the workings of visual perception, as well as the human mind that processes it. What is meaningful in the data must be recognizable to the eyes.

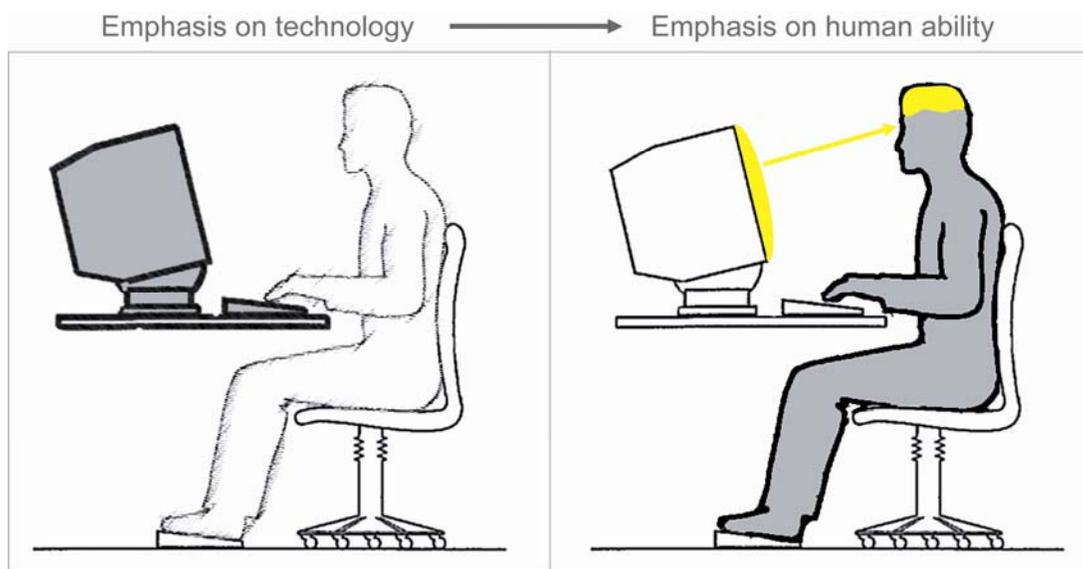


Figure 1: The differences between emphasizing technology vs. human ability.

Most business intelligence software today demonstrates little knowledge of or concern for the workings of visual perception. Garish colors fill the screen and assault the senses. 3-D charts confuse the senses. Charts that are poorly chosen and designed degrade into nonsense an otherwise simple message. There is no excuse for these barriers to perception. Scientific research has provided a wealth of information about visual perception—what works, what doesn't, and the reasons why. Vendors cannot simply present a copy of Minard's graphical representation of Napoleon's devastating campaign against Russia, as proof that they once

attended Edward Tufte’s workshop on data visualization. They must now actually incorporate the information display principles that Tufte and I have preached for years. Personally, I would like to stop discussing the fundamentals of data visualization and move on to more interesting challenges.

Whenever you examine software, especially when considering a purchase, the primary question you should ask is “Does it really work?”. If the software is for data analysis, does it actually promote understanding? Does what it presents to your eyes and brain actually make sense? Do meaningful aspects of the data become clearly visible? If it fails these simple tests, the software is worthless, no matter how flashy the display. Don’t be fooled. When customers demand what really works, vendors will stop wasting their time with unimportant fluff.

Graphical dazzle can fail to communicate effectively, even when rendered as beautifully as this pie chart. Notice how long it takes you to put the seven industries in order, based on loan percentage. Next, notice how difficult it is to compare percentages, such as those of the “Pharma” and “Agro” industries. By how much do they differ?

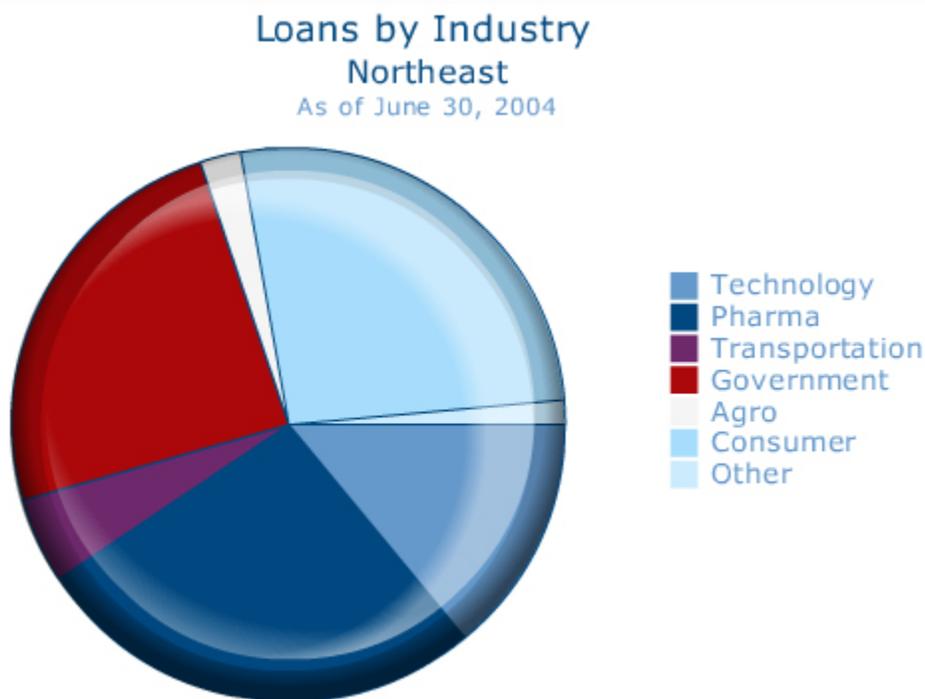


Figure 2: Graph of loans by industry.

Now shift your attention to the graph below, which displays precisely the same data, but in a way that is much easier to interpret and compare. Though simple—actually, largely because of its simplicity—this bar graph communicates the data eloquently.

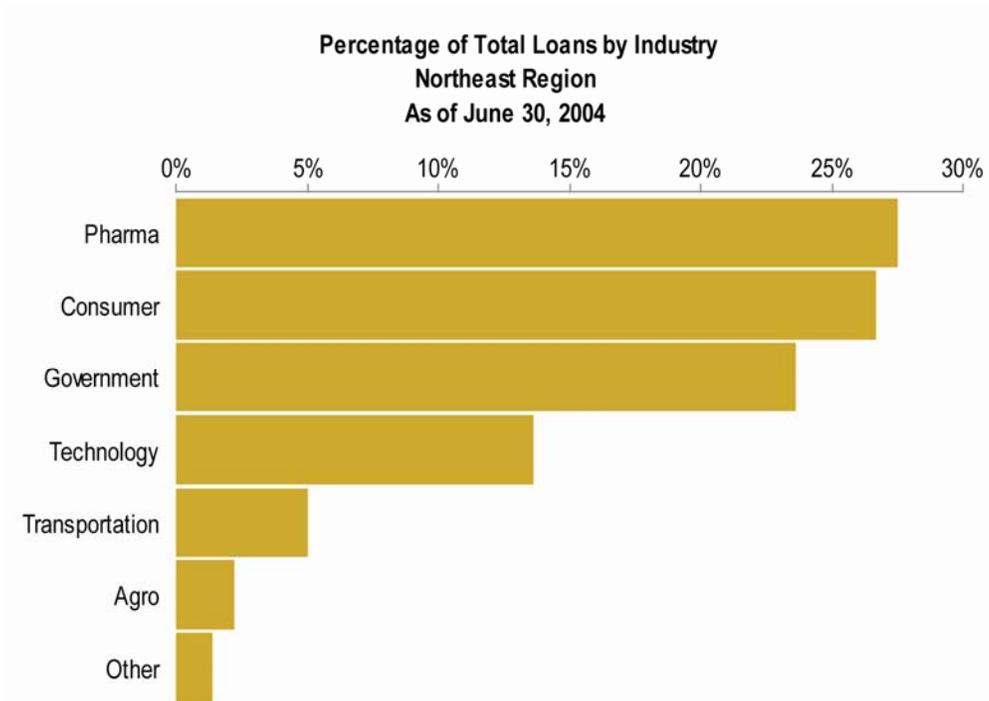


Figure 3: This bar graph analyzes the percentage of total loans by industry.

One of the most dangerous claims made by business intelligence software vendors is the exaggerated boasts that their software enables “self service.” Such claims are dangerous for both their customers and themselves. While the idea that business intelligence software should be easy to use for everyone is nice, the suggestion that anyone can install software on their computer and instantly become a skilled and productive data analyst and communicator is a fantasy. Even the best designed business intelligence software imaginable won’t enable you to do what you don’t already know how to do on your own. Data analysis and communication requires a set of skills that must be learned. Business intelligence vendors should spend more time incorporating best practices into their software. This would make it easier for you to do what works and harder to do what doesn’t. They should also help you develop the skills needed to productively use their software. I’m not just talking about teaching you what menu item to click to get a chart to appear; I’m talking about teaching you the conceptual skills needed to analyze and communicate data. To successfully do this, vendors might need to brush up on this a bit themselves.

I believe that most of the data analysis needed by businesses is relatively simple and routine. By this, I mean that the necessary analytical skills do not require a degree in statistics or advanced courses in financial analysis. This is good, because most of the work done by businesses today to make sense of data is performed by people without such backgrounds. Those tasked with understanding business data are found throughout the organization. And they usually don’t have the word “analyst” in their titles.

Sophisticated data analysis, done by expert, highly-trained analysts, often requires equally sophisticated software with loads of statistical functionality. For the rest of us doing most of the work, however, there should be software designed to make simple business data analysis easy. While you’ll still need to learn analytical techniques for the work, these techniques are not difficult to learn.

As it turns out, these techniques are best enabled through simple visual representations of data. Business intelligence software that incorporates simple visual analysis functionality easily and efficiently is emerging. We should be grateful for this. But this functionality and ease of use must become more common. Clearly, they must be offered by more than the few small vendors currently doing most of the good work in data visualization.

This has been a bit of a rant, hasn't it? As you can tell, I feel passionately about business intelligence. I am especially passionate about its opportunity to tap into the rich potential of data visualization. Next month, the [Business Intelligence Network](#) (B-EYE-NETWORK) and I will introduce a monthly newsletter dedicated to visual analysis and communication. Each month we'll feature one of my articles, as well as an article by a guest expert in some aspect of data visualization. I'm eager to introduce the work of several talented friends, including those involved in the academic research that is generating many exciting approaches to visual data analysis. We'll cover many data visualization topics that apply to business intelligence, ranging from the fundamental principles and practices of effective graph and dashboard design, to some of the most cutting-edge visual analysis techniques being developed in academic research labs and elsewhere.

In addition to the newsletter, next month the B-EYE-NETWORK and I will begin a blog. My blog will include various ideas and opinions about business intelligence and data visualization. I promise to always shoot straight and to often be provocative. Please join me in this effort to focus on the "I" in BI. By working together to give wise counsel, we can kick this exciting industry into the next phase of its promising life.

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](#).