



Harvard Business Review

REPRINT H02FP8
PUBLISHED ON HBR.ORG
OCTOBER 21, 2015

ARTICLE **ANALYTICS**

5 Essential Principles for Understanding Analytics

by Thomas H. Davenport

For the exclusive use of G. Executive Education, 2018.

I have designed or taught in analytics programs for managers at Babson, Harvard, MIT, Boston University, and University College Cork, so I have some opinions about what content ought to be included. If you're a potential consumer of programs like these, make sure the one you sign up for has the components you will read about below. Or do some targeted reading in these areas.

Identifying and Framing the Analytical Problem: A proper quantitative analysis starts with recognizing a problem or decision and beginning to solve it. In decision analysis, this step is called framing, and it's one of the most critical parts of a good decision process. There are various sources that lead to this first step, including pure curiosity (a manager's common sense or observation of events), experience on the job, or the need for a decision or action.

At this early stage, the analytics haven't yet come into play. The decision to forge ahead with some sort of analysis may be driven by a hunch or an intuition. The standard of evidence at this point is low. Of course, the whole point of a quantitative analysis is to eventually test your hunch against data. (And that's the key difference between analytical thinkers and others: they test their hunches with evidence and analysis.)

What managers need to focus on in the framing stage is that they have systematically identified and assessed the problem, and that they have considered alternate framings. It may be helpful to discuss the issue with quantitative analysts who have a sense of how alternative framings might be pursued. (If you want to know more about framing an analytical problem, I've written a whole chapter about it in my book, [Keeping Up With the Quants](#).)

Working with Quantitative People: Speaking of quantitative analysts, it's really important for managers to establish a close working relationship with them. You have the understanding of the business problem; your "quant" has the understanding of how to gather data on and analyze it. In order for this relationship to work, each party needs to reach out to the other. You, as the largely non-quantitative manager, need to help your analyst understand your problem fully, perhaps through having them work in the relevant area of the business for several days. Your quant needs to communicate with you in normal business language, engage with your issue, and work at it until you're satisfied. Your analyst may not be particularly good at interfacing with managers, and you may be intimidated by quantitative analysis. But somehow [you need to find common ground](#).

Understanding Different Types of Data and Their Implications: These days, you'll hear a lot about big data and how valuable it can be to your business. But most managers don't really understand the difference between big and small data, and they use the term "big data" indiscriminately. How you refer to your data doesn't matter much, but it's important to know about the differences between various types.

Small data—which, despite its name is extremely useful—is data that's of manageable size (able to fit on a single server), that's already in structured form (rows and columns), and that changes relatively infrequently. It's most likely to come from your organization's transaction systems such as financial

For the exclusive use of G. Executive Education, 2018.

systems, CRM, or order management. This type of data has probably been analyzed for many years. It doesn't get much press these days, but it's essential for knowing your customers, understanding your company's financial performance, and tuning your supply chain.

Big data is unruly. It's too big to fit on a single server, is relatively unstructured, and fast moving. It's more likely to be about the world outside your business transactions—what your customers and prospects are saying on social media, what they're telling your call center reps, and how they're moving around your store. Big data offers great opportunity, but it's often a challenge to get it into a structured form that can be easily analyzed. If you want to pursue it, your quant partner probably needs to be a [data scientist](#).

Understanding Different Types of Analytics and Their Implications: For many years, the vast majority of analytics were descriptive—simple reports or dashboards with numbers about what happened in the past. But that's not the only type out there. Predictive analytics use statistical models on data about the past to predict the future. Prescriptive analytics create recommendations for how workers can make decisions in their jobs. Most managers need some urging to adopt the less familiar predictive and prescriptive analytics, which are typically far more valuable than the descriptive variety. A few years ago, I did a [video](#) explaining the difference between descriptive, predictive, and prescriptive analytics that will come in handy for managers who need a refresher. These are still very important, but now I am increasingly focused on a new type: automated analytics. These analytical decisions are made not by humans, but by computers. Many common analytical decisions, such as those about issuing credit by banks or insurance policies, are made entirely automatically. They portend a lot of change in how we organize and manage analytics within firms, and may even [pose a threat to many decision-makers' jobs](#).

Exploring Internal and External Uses of Analytics: Finally, managers need to be aware of the distinction between internal and external uses of analytics. Historically, analytics were used almost exclusively to support internal decisions. That's still useful, of course, but now companies are also using data and analytics to create new products and services. And it's not just the digital players you would expect, like Google and LinkedIn; mainstream firms like GE, Monsanto, and several large banks are pursuing such "data products." This is a new option for organizations that managers need to understand and explore.

Getting a grasp on these fundamentals won't make you an analytics expert, but it will make you a more effective consumer of this important resource. And in today's business world, not knowing about analytics can be dangerous to you and your company's prosperity.

Thomas H. Davenport is the President's Distinguished Professor in Management and Information Technology at Babson College, a research fellow at the MIT Initiative on the Digital Economy, and a senior adviser at Deloitte Analytics. Author of over a dozen management books, his latest is [Only Humans Need Apply: Winners and Losers in the Age of Smart Machines](#).
