

# HOW TO MEASURE ANYTHING

FINDING THE VALUE OF  
*INTANGIBLES* IN BUSINESS



Douglas W. Hubbard

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# How to Measure Anything

Finding the Value of  
"Intangibles" in Business


DOUGLAS W. HUBBARD



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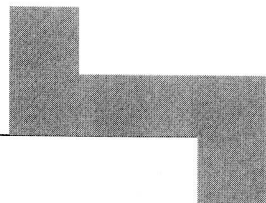
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# How to Measure Anything

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*I dedicate this book to the people who are my inspirations for so many things: my wife Janet and to our children Even, Madeleine, and Steven who show every potential for being renaissance people.*

*I also would like to dedicate this book to the military men and women of the United States, so many of whom I know personally. I've been out of the Army National Guard for many years, but I hope my efforts at improving battlefield logistics for the U.S. Marines by using better measurements have improved their effectiveness and safety.*



# Preface

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I wrote this book to correct a costly myth that permeates many organizations today: that certain things can't be measured. The widely held belief must be a significant drain on the economy, public welfare, the environment, and even national security. "Intangibles" such as the value of quality, employee morale, or the economic impact of cleaner water are frequently part of some critical business or government policy decision. Often, an important decision requires better knowledge of the alleged intangible but when an executive believes something to be immeasurable, attempts to measure it will not even be considered.

As a result, decisions are less informed than they could be. The chance of error increases. Resources are misallocated, good ideas are rejected, and bad ideas are accepted. Money is wasted. In some cases life and health are put in jeopardy. The belief that some things—even very important things—might be impossible to measure is sand in the gears of the entire economy.

Any important decision maker could benefit from learning that anything they really need to know is measurable. On the other hand, in a democracy and a free enterprise economy, voters and consumers count among these "important decision makers." Chances are, your decisions in some part of your life or your professional responsibilities would be improved by better measurement. And it's virtually certain that your life has already been affected—negatively—by the lack of measurement in someone *else's* decisions.

I've made a career out of measuring the sorts of things many thought were immeasurable. I first started to notice the need for better measurement in 1988, shortly after I started working for Coopers & Lybrand as a brand-new MBA in their management consulting practice. I was surprised at how often

a client would dismiss a critical quantity—something that would affect a major new investment or policy decision—as completely beyond measurement. Statistics and quantitative methods courses were still fresh in my mind and I in some cases when someone called something “immeasurable,” I would remember a specific example where it was actually measured. I began to suspect any claim of immeasurability as possibly premature and I would do research to confirm or refute the claim. Time after time, I kept finding that the allegedly immeasurable thing was already measured by an academic or perhaps professionals in another industry.

At the same time, I was observing that books about quantitative methods didn’t focus on making the case that everything is measurable. They also did not focus on making the material accessible to the people who really needed it. They start with the assumption that the reader already believes something to be measurable, and it is just a matter of executing the appropriate algorithm. And these books tended to assume that the objective of the reader was a level of rigor that would suffice for publication in a scientific journal—not merely a decrease in uncertainty about some critical decision with a method a non-statistician could understand.

In 1995, after years of these observations, I decided that a market existed for better measurements for managers. I pulled together methods from several fields to create a solution. The wide variety of measurement-related projects I had since 1995 allowed me to fine-tune this method. Not only was every alleged immeasurable turning out not to be so, the most intractable “intangibles” were often being measured by surprisingly simple methods. It was time to challenge the persistent belief that important quantities were beyond measurement.

In the course of writing this book, I felt as if I was exposing a big secret and that once the secret was out, perhaps a lot of things will be different. I even imagined it would be a small “scientific revolution” of sorts for managers—a distant cousin of the methods of “scientific management” introduced a century ago by Frederick Taylor. This material should be even more relevant than Taylor’s methods turned out to be for twenty-first century managers. Whereas scientific management originally focused on optimizing labor processes we now need to optimize measurements for management decisions. Formal methods for measuring those things management usually ignores has barely reached the level of alchemy. We need to move from alchemy to the equivalent of chemistry and physics.

The publisher and I considered several titles. All the titles considered started with “How to Measure Anything” but it wasn’t always followed by “Finding the Value of Intangibles in Business.” I give a seminar called “How to Measure Anything, But Only What You Need To.” Since the methods in this book include computing the economic value of measurement (so that we know where to spend out measurement efforts), it seemed particularly appropriate. We also considered “How to Measure Anything: Valuing Intangibles in Business, Government and Technology” since there are so many technology and government examples in this book alongside the general business examples. But the title “How to Measure Anything: Finding the Value of Intangibles in Business” seemed to grab the right audience and convey the point of the book without necessarily excluding much of what the book is about.

The book is organized into four sections. The chapters and sections should be read in order because the first three sections rely on instructions from the earlier sections. Section I makes the case that everything is measurable and offers some examples that should inspire readers to attempt measurements even when it seems impossible. It contains the basic philosophy of the entire book and, if you don’t read anything else, read this section. In particular, the specific definition of measurement discussed in this section is critical to correctly understand the rest of the book.

Section II begins to get into more specific substance about how to measure things—specifically uncertainty, risk—and the value of information. These are not only measurements in their own right but, in the approach I’m proposing, prerequisites to all measurements. The reader will learn how to measure their own subjective uncertainty with “calibrated probabilities assessments” and how to use that information to compute risk and the value of additional measurements. It is critical to understand these concepts before moving on to the next section.

Section III deals with how to reduce uncertainty by various methods of observation including random sampling and controlled experiments. It provides some short-cuts for quick approximations when possible. It also discusses methods to improve measurements by treating each observation as updating and marginally reducing a previous state of uncertainty. It reviews some material that readers may have seen in first-semester statistics courses, but it is written specifically to build on the methods discussed in the previous section. Some of the more elaborate discussions on regression



modeling and controlled experiments could be skimmed over or studied in detail, depending on the needs of the reader.

Section IV is an eclectic collection of interesting measurement solutions and case examples. It discusses methods for measuring such things as preferences, values, flexibility, or quality. It covers some new or obscure measurement instruments including calibrated human judges or even the Internet. It summarizes and pulls together the approaches covered in the rest of the book with detailed discussions of two case studies and other examples.

In Chapter 1, I suggested a challenge for readers and I will reinforce that challenge by mentioning it here. Write down one or more measurement challenges you have in home life or work and read this book with the specific objective of finding a way to measure them. If those measurement influence a decision of any significance, then the cost of the book and the time to study it will be paid back many fold.



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# Measurement: The Solution Exists

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# The Intangibles and the Challenge

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*When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the state of science.*

—LORD KELVIN

Anything can be measured. If a thing can be observed in any way at all, it lends itself to some type of measurement method. No matter how “fuzzy” the measurement is, it’s still a measurement if it told you more than you knew before. And those very things most likely to be seen as immeasurable are, virtually always, solved by relatively simple measurement methods.

As the title of this book indicates, we will discuss how to find the value of those things often called “intangibles” in business. There are two common understandings of the word intangible. First, it is routinely applied to things that, while they are literally not tangible (i.e., touchable, solid objects), can still be measured. Things like time, budget, patent ownership, and so on are