

# Turning Numbers into Knowledge

**MASTERING THE ART OF PROBLEM SOLVING**

Second Edition

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# INTRODUCTION

## THE INFORMATION EXPLOSION

In 1815, Thomas Jefferson's library of 6,500 volumes represented an exemplary collection of works by the world's great thinkers. A diligent student who read two books a day, 325 days per year, could peruse the entire collection in ten years. At the time, Jefferson's collection was a large one, and someone who read the library in its entirety could reasonably claim familiarity with the most important knowledge of western civilization.

The same diligent student would have to spend a bit more time to read all the books and manuscripts in the Library of Congress today. At the same rate of 650 books per year, it would take more than 27,000 years to read them all (and that's not even counting the tens of thousands of new books written every year!)<sup>4</sup>

The two centuries since Jefferson, particularly the last half-century, have been extraordinary ones for human knowledge. The pace of change has quickened noticeably, and the rate of information production has increased by many orders of magnitude,<sup>5</sup> driven by rapid progress in science and technology and by vastly improved information transmission, processing, gathering, and storage capabilities.<sup>6</sup> For the first time in human history, information is being created at a rate far faster than humans can assess and use it.

David Shenk, who documents these trends in his book *Data Smog*, reports (among other things) that

In 1971 the average American was targeted by at least 560 daily advertising messages. Twenty years later that number had risen sixfold, to 3,000 messages per day.

Paper consumption per capita in the United States tripled from 1940 to 1980 (from 200 to 600 pounds) and tripled *again* from 1980 to 1990 (to 1,800 pounds). In the 1980s the use of third-class mail (for sending publications) grew 13 times faster than the population.

Two-thirds of business managers surveyed report tension with col-

leagues, loss of job satisfaction, and strained personal relationships as a result of information overload.<sup>7</sup>

In recent years, rapid growth in email spam has only exacerbated these trends, with more than 90% of emails made up of unwanted spam in 2007.

People usually react to such information overload in one of two ways:

- *They keep reading and never shut down the flow of information* in hopes that something new might emerge to help them solve the problem at hand. In this case, people can be paralyzed by too much information.<sup>8</sup>
- *They shut out new information because it's overwhelming.* People afflicted with this reaction are handicapped by too little information. They rely on old knowledge and ideology, and make bad decisions because they close off the flow.

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My goal is to help you plot a middle course between these two extremes, giving you tools and tricks to help you face the onslaught of new information with equanimity. The rest of this book will hone your analytical instincts and prepare you to prosper in this information-glutted world.

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*Our networks are awash in data. A little of it is information. A smidgen of this shows up as knowledge. Combined with ideas, some of that is actually useful. Mix in experience, context, compassion, discipline, humor, tolerance, and humility, and perhaps knowledge becomes wisdom. — CLIFFORD STOLL*



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