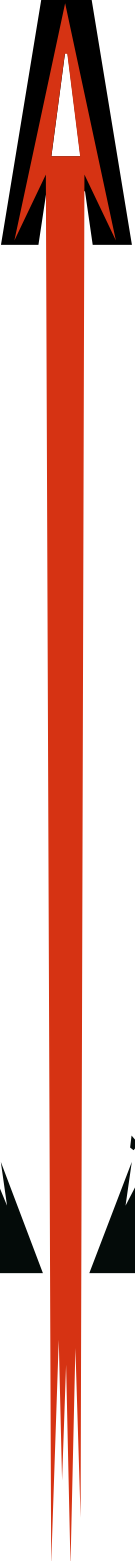


CRACKED IT!



**HOW TO
SOLVE BIG
PROBLEMS
AND SELL
SOLUTIONS
LIKE TOP
STRATEGY
CONSULTANTS**

**BERNARD GARRETTE
COREY PHELPS
OLIVIER SIBONY**

Cracked it!

Bernard Garrette • Corey Phelps
Olivier Sibony

Cracked it!

How to solve big problems and sell
solutions like top strategy consultants

palgrave
macmillan

Bernard Garrette
HEC Paris School of Management
Jouy-en-Josas, France

Olivier Sibony
HEC Paris School of Management
Jouy-en-Josas, France

Corey Phelps
Desautels Faculty of Management
McGill University
Montreal, QC, Canada

ISBN 978-3-319-89374-7 ISBN 978-3-319-89375-4 (eBook)
<https://doi.org/10.1007/978-3-319-89375-4>

Library of Congress Control Number: 2018944260

© The Editor(s) (if applicable) and The Author(s) 2018

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Cover illustration: alashi/DigitalVision Vectors/Getty

Printed on acid-free paper

This Palgrave Macmillan imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Business leaders praise Cracked It!

“When dealing with a major business issue, every decision maker is facing his own cognitive biases, rooted in experience and personality. In *Cracked It!*, the authors not only remind us of the importance of challenging even obvious solutions or ideas, by taking a step back, thinking differently, and walking in the other’s shoes – be it a customer or an audience – but they also provide practical, value-creating and proven insight.”

—Stéphane Richard, *Chairman and Chief Executive Officer, Orange*

“The future is no longer what it used to be. The business world is undergoing unprecedented disruption. Every problem is more complex. *Cracked It!* will be the bible of the true problem solvers.”

—Daniel Bernard, *Former Chairman and Chief Executive Officer, Carrefour*

“If you want to master problem solving, buy this book. It will save you from coming to sloppy conclusions and guide you through every aspect of the process of solving a problem. I used it the day after I started reading it.”

—Neil Janin, *Chairman, Bank of Georgia, and Senior Partner Emeritus, McKinsey*

“Too often at the Board or executive level, time is wasted looking for solutions to a problem which has not been clearly defined. Garrette, Phelps and Sibony provide a structured approach to defining problems which should prove useful to practitioners.”

—Paul M Tellier, *Former Chief Executive Officer, Bombardier
and Canada National Railways*

Thought leaders praise Cracked It!

“Too many companies fail because of bad strategy. This book is full of frameworks and tips to help you avoid that fate.”

—Adam Grant, New York Times *bestselling author of Give and Take, Originals, and Option B with Sheryl Sandberg*

“Written by a trio of leading experts on strategy who draw both on decades of rigorous academic research and consulting experience, *Cracked It!* offers a crystal clear approach to frame and solve challenging strategic issues. A must-read for executives, consultants, business school students and leaders in charge of transforming their organizations.”

—Laurence Capron, *Professor of Strategy and Dean of Faculty, INSEAD*

“CEOs regularly pay a king’s ransom to the top management consulting firms for help in solving their most complex problems. You may not have the consultant’s connections or their knowledge of the industry, but this book will help you learn the secrets of their problem-solving process so you can tackle your own problems more effectively.”

—Chip Heath, *Coauthor of Switch and The Power of Moments*

“Why do smart and experienced executives sometimes make spectacularly bad decisions? This book exposes the flaws in analysis that lie at the root of the problem. Building on deep academic insights and lots of real-world experience, Garrette, Phelps and Sibony lay out a structured problem-solving approach to overcome the many pitfalls that executives fall into. They don’t just tell you how to get the analysis right, they also explain how to sell your advice to others. An invaluable guide to anyone who is involved in decision-making in the business world today.”

—Julian Birkinshaw, *Author of Fast/Forward, Professor and Deputy Dean, London Business School*

“This is a GREAT ‘how to’ book for tackling strategic problems and becoming a better strategic thinker. It not only describes all the major frameworks used by strategy analysts, but also shows their pitfalls and how to decide when a particular framework will be useful. All of the concepts in the book are also demonstrated with real case studies that bring the process of strategic analysis to life.”

—Melissa Schilling, *Author of Quirky and Herzog Family Professor of Management, Stern School of Business, New York University*

“Problem solving is a critical skill for managers and entrepreneurs and often underserved in business education. *Cracked It!* does a phenomenal job in presenting a full problem solving framework grounded in sound theory, tested in years of practice and fun to read.”

—Franz Heukamp, *Dean, IESE Business School*

Strategists praise Cracked It!

“A fully comprehensive and practical introduction to problem-solving tools and techniques.”

—Georges Desvaux, *Senior Partner and Managing Partner, Africa, McKinsey & Company*

“Strategy is problem solving – an important, subtle and pervasive skill for which business practitioners receive little formal training. Garrette, Phelps and Sibony provide a valuable and practical guide to the art, from framing the problem through to communicating and selling the solution, which should be invaluable to practitioners and consultants.”

—Martin Reeves, *Director, BCG Henderson Institute*

“A great read for all current and future business leaders! The secret sauce of solving hard problems and selling solutions to drive change is at your doorstep. Just go get it!”

—Eric Gervet, *Lead Partner, AT Kearney, San Francisco office*

“The companies that win will be those that use superior problem solving tools. *Cracked It!* teaches you how. It captures the real world experience of successful problem solving and presents the learnings in an engaging style.”

—Rima Qureshi, *Executive Vice President and Chief Strategy Officer, Verizon*

“The ABSOLUTE reference handbook on problem solving! It is clearly unique and it smartly introduces an amazing richness of methods, through cases and easy to understand frameworks. I have to say... I love it!”

—Jean-Baptiste Voisin, *Chief Strategy Officer, LVMH*

“In an uncertain world that defies comprehension, we are forced to make intuitive decisions... but our problem-solving process must be rational. Therein lies *Cracked It!*’s greatest value. Readers will learn how to shape an effective problem-solving process to channel intuition into rationality and avoid the mistakes that ensnare the amateur strategist.”

—General Vincent Desportes, *French Army*

Acknowledgments

As strategy professors, we interact with a broad range of audiences, from undergraduate students to MBA participants to senior executives. Despite very different backgrounds and expectations, all of them consistently tell us that they struggle with a common challenge: how to *apply* what they learn.

Our students tell us that the tools and concepts of business management are relatively easy to understand. Analyzing the structure of an industry or assessing whether a company has a cost advantage is not, after all, an extraordinary intellectual challenge for people who often have advanced degrees in non-business fields, not to mention many years of successful experience. When the time comes to apply the same tools to real business situations, reality does not conform to the stereotype presented in the textbooks—or even to the stylized examples presented in case studies. The problems business people face are complex. Situations are ambiguous. Facts are unclear. Expectations change quickly. Whether it is learned in school or on the job, business knowledge provides executives with a treasure trove of frameworks. But it does not help them to recognize and make sense of the problems.

In 2014, we set out to fill this gap by developing a course on problem solving for the core curriculum of the HEC Paris MBA. We soon realized we needed to address aspects of business communication as an integral part of the course, for reasons that will become clear as you read this book. After many iterations and refinements, the course morphed into the method described in this book.

A significant inspiration for this book is the problem-solving method developed and refined over many years by McKinsey consultants. Because the very nature of top management consulting is to help senior executives make sense of the toughest problems they deal with, problem-solving proficiency is at the

heart of what McKinsey consultants do. Like almost everything in this extraordinary firm, it is passed on from generation to generation, in the spirit of apprenticeship. Olivier is immensely grateful to the masters who taught him the ropes as a young consultant, but also to all the colleagues, from the partners to the summer associates, who challenged him in countless team meetings over a quarter century.

We are indebted to the hundreds of students and executives who participated in our problem solving and communication seminars over the past few years. Not only did they force us to clarify and refine our thinking continuously, but they also kept telling us that something was missing: the course was long enough to make them aware of the need to hone their problem-solving skills, but too short for them to become familiar with all the tools and techniques required. Where, they asked us, is the book they can read to become better problem solvers? We hope the answer is now in your hands.

Many parts of this book benefited from the input and wisdom of colleagues. To name only a few, we would like to thank Blaise Allaz, Pierre Dussauge, Thierry Foucalt, Andrea Masini, Anne-Laure Sellier, and Mathis Schulte, who have been instrumental in extending the scope of our problem-solving views toward their respective areas of expertise. More generally, we are indebted to all our colleagues at our home schools—HEC Paris and McGill—as well as to friends and colleagues from other institutions we collaborate with, such as IESE and Saïd Business School, who engaged in stimulating conversations with us at various stages of the project. We insist that all remaining errors are ours.

We also benefited from research support from HEC Paris, the HEC Foundation, and the Desautels Faculty of Management at McGill University, which we gratefully acknowledge.

Turning a classroom experience into a book is an interesting challenge. We hope this book has retained some of the “hands-on” feel that we strive for in our teaching, while following the conventions that make it possible for a reader to navigate it easily. If we’ve had any success in this endeavor, our editor Jennifer Worick deserves much of the credit. Isabelle Huynh, our visual editor, helped us convert our cluttered slides into the elegant visuals you will discover. We are also grateful to Stephen Partridge and Gabriel Everington of Palgrave Macmillan for their patient and supportive work.

Working on a book is like any relationship—it requires care and attention, and sometimes, it can become all-consuming. It can provide joy one day, and frustration the next. It can also impact other relationships and benefit from them. Bernard wants to thank Béatrice for her loving care and

support, especially in the challenging personal circumstances that surrounded the completion of this work. Corey's wife, Tiffany, and kids, Chloé-Rose and Connor, went through a lot and did a lot to support him during the project, for which he is extremely grateful. Olivier is equally grateful to Anne-Lise, Fantin, and Lélia for their unfailing encouragement and patient support.

Contents

1	The Most Important Skill You Never Learned	1
	Fast and Slow Problem Solving	2
	Problem Solving and the Expertise Trap	5
	Complex Problems and “Unknown Unknowns”	7
	The Need for a Disciplined Problem-Solving Process	10
	Chapter 1 in One Page	12
2	The Five Pitfalls of Problem Solving	15
	Case 1: When the Music Industry Went Out of Tune	15
	Pitfall 1: Flawed Problem Definition	16
	Case 2: The Grameen–Danone Strengthening Yogurt	18
	Pitfall 2: Solution Confirmation	21
	Case 3: The Call Center Story	22
	Pitfall 3: Wrong Framework	23
	Case 4: New Strategy at J.C. Penney	25
	Pitfall 4: Narrow Framing	26
	Case 5: A Fat Chance for Sugar	29
	Pitfall 5: Miscommunication	32
	Chapter 2 in One Page	33
3	The 4S Method	35
	Where Does the 4S Method Come from?	35
	An Overview of the 4S Method	41
	State: A Problem Well Posed Is Half-Solved	43

Structure: The Architecture of Problem Solving	44
Solve: Between Analysis and Creativity	46
Sell: Choose the Approach That Suits Your Audience	48
Chapter 3 in One Page	51
4 State the Problem: The TOSCA Framework	53
Trouble: What Makes This Problem Real and Present?	54
Owner: Whose Problem Is This?	57
Success Criteria: What Will Success Look Like, and When?	58
Constraints: What Are the Limitations and Trade-Offs?	60
Actors: Who Are the Stakeholders?	61
Write the Core Question	62
Singing TOSCA as a Choir	65
Chapter 4 in One Page	67
5 Structure the Problem: Pyramids and Trees	69
Hypothesis-Driven Problem Structuring	71
Building a Hypothesis Pyramid	72
Hypothesis-Driven Problem Structuring: Pros and Cons	79
Issue-Driven Problem Structuring	84
Growing Issue Trees	86
Growing a Tree or Building a Pyramid?	89
Chapter 5 in One Page	92
6 Structure the Problem: Analytical Frameworks	95
Using Frameworks to Breakdown Problems	96
The Danger of Frameworks: Frameworks as Mental Models	99
Industry Frameworks: Value Drivers	101
Functional Frameworks	105
When All Else Fails, Try Good Old Logic	113
Chapter 6 in One Page	115
7 Solve the Problem: Eight Degrees of Analysis	117
From Structuring to Analyses	117
Eight Degrees of Analysis	121
Planning the Work	125
Conducting the Analysis	126
Chapter 7 in One Page	136

8	Redefine the Problem: The Design Thinking Path	139
	Design Thinking and When to Use it	142
	Five Phases, One Mindset	144
	Phase 1: Empathize	147
	Phase 2: Define	156
	Chapter 8 in One Page	165
9	Structure and Solve the Problem Using Design Thinking	169
	Phase 3: Ideate	171
	Phase 4: Prototype	182
	Phase 5: Test	186
	Chapter 9 in One Page	191
10	Sell the Solution: Core Message and Storyline	197
	Don't Tell the Story of the Search, Tell the Story of the Solution	198
	The Pyramid Principle	200
	Pave the Way for a Dialogue	204
	Design Your Storyline	205
	Go for Either a Grouping or an Argument	213
	Chapter 10 in One Page	220
11	Sell the Solution: Recommendation Report and Delivery	223
	Manage Communications Throughout the Process	224
	Beware the PowerPoint Curse	225
	Create an Effective, Modular Report	226
	Develop the Content Pages	230
	Make Quantitative Charts Relevant and Simple	233
	Use Conceptual Charts Sparingly	241
	Trim the Deck Ruthlessly	241
	Quality Control	243
	Beyond Slide Presentations	243
	Chapter 11 in One Page	248
12	The 4S Method in Action	251
	Case Study: The Kangaroo Opportunity	251
	What Is the Problem?	255
	Structuring the Problem	257

Solving the Problem	257
Selling the Solution	259
Appendix: First Section of a Report on the Kangaroo Case Study	263
13 Conclusion: Becoming a Master Problem-Solver	271
Index	275

List of Figures

Fig. 3.1	The 4S method	42
Fig. 4.1	TOSCA problem statement worksheet	64
Fig. 5.1	The hypothesis pyramid	72
Fig. 5.2	First level of a hypothesis pyramid on the Librinova case	73
Fig. 5.3	More complete hypothesis pyramid on the Librinova case	77
Fig. 5.4	Issue tree structure	85
Fig. 5.5	Preliminary issue tree on the Librinova case	87
Fig. 5.6	More complete issue tree on the Librinova case	88
Fig. 5.7	When to use a hypothesis pyramid or an issue tree	91
Fig. 6.1	A stock analyst's framework	96
Fig. 6.2	A basic question breakdown for a private equity firm	97
Fig. 6.3	Private equity firm issue tree	97
Fig. 6.4	Private equity firm issue tree (continued)	98
Fig. 6.5	Three ways to break down questions	100
Fig. 6.6	Simple breakdown of Starbucks question	101
Fig. 6.7	Starbucks issue tree first attempt	102
Fig. 6.8	Starbucks issue tree using industry framework	103
Fig. 6.9	Starbucks issue tree using functional framework	105
Fig. 6.10	Starbucks issue tree using functional framework (continued)	106
Fig. 6.11	Starbucks issue tree using a logical decomposition	113
Fig. 7.1	First level of hypothesis pyramid on Solar case	118
Fig. 7.2	More complete hypothesis pyramid on Solar case	119
Fig. 7.3	Analysis plan for Solar case (sub-hypothesis 1)	121
Fig. 7.4	Analysis plan for Solar case (sub-hypothesis 2)	122
Fig. 7.5	Analysis plan for Solar case (sub-hypothesis 3)	123
Fig. 8.1	Process of design thinking	144
Fig. 8.2	Template for user empathy map	158

Fig. 10.1	The pyramid principle	201
Fig. 10.2	Storyline on the Librinova case	207
Fig. 10.3	Storyline patterns	217
Fig. 11.1	From storyline to slide deck	227
Fig. 11.2	First page of Mustang Airlines report	228
Fig. 11.3	First page of Summit Water report	229
Fig. 11.4	First storyline page of Summit Water report	230
Fig. 11.5	Second storyline page of Summit Water report	231
Fig. 11.6	Content page in a report on the Mustang Airlines problem	232
Fig. 11.7	Quantitative chart templates	235
Fig. 11.8	Column chart of a time series	236
Fig. 11.9	Pie and stacked columns charts	237
Fig. 11.10	Waterfall chart	238
Fig. 11.11	Bar chart	238
Fig. 11.12	Frequency distribution	239
Fig. 11.13	Paired bar chart showing ranking correlation	240
Fig. 11.14	Correlation of price per watt and installed capacity of renewable energy sources	240
Fig. 11.15	Conceptual chart templates	242
Fig. 11.16	Report and presentation checklist	244
Fig. 12.1	Issue tree on the Kangaroo case study	258

List of Tables

Table 6.1	Selected marketing frameworks	108
Table 6.2	Selected strategy frameworks	109
Table 6.3	Selected organization and change frameworks	110
Table 6.4	Selected operations frameworks	110
Table 6.5	Selected finance frameworks	111
Table 8.1	How to be a good observer	150
Table 8.2	How to conduct semi-structured interviews	152
Table 8.3	How to build a journey map	160
Table 8.4	Synthesizing user needs, user insights, and design imperatives	162
Table 9.1	Using SCAMPER to ideate	179

1

The Most Important Skill You Never Learned

On July 16, 2004, Michael Dell, Chairman and Chief Executive Officer (CEO) of Dell Inc., announced that longtime Dell senior executive and Chief Operations Officer Kevin Rollins would take over as CEO of the company formerly known as Dell Computer. Before joining Dell in 1996, Rollins had been a VP and partner at the consultancy Bain & Company, where he advised Dell on its famous direct business model. At the time of Rollins's anointing, Dell was the world's largest and most profitable producer of computers. Its stock closed just above \$35, the highest since the bursting of the tech bubble in the summer of 2000. Only two and a half years later, at the beginning of 2007, the situation was very different. Revenue growth had slowed significantly, market share had declined, and HP had knocked Dell out of the top spot as the world's largest computer manufacturer. Dell had also repeatedly missed analysts' earnings estimates, and its stock price had dropped by nearly a third. In late 2006, Dell recalled over four million laptops because batteries were exploding or igniting. A few months earlier, the US Securities and Exchange Commission (SEC) launched an investigation into accounting irregularities relating to the timing and recognition of income and expenses, which led to a restatement of Dell's net income for 2003–06. Finally, an internal employee survey had bluntly signaled declining confidence in Dell leadership.

Dell Inc. had a problem. Shareholders and employees were unhappy with the situation and desperate for a return to better performance. As Chairman and the largest shareholder, Michael Dell “owned” this business problem and had a powerful incentive to solve it quickly. If you were Michael Dell in early 2007, what would you have done to tackle this issue?

Fast and Slow Problem Solving

The problem Dell faced in early 2007 involved a complex set of poorly understood factors, which made it hard to define the problem, let alone know how to solve it. Such complex and ill-defined problems are idiosyncratic and infrequently occur, making it difficult to develop routine solutions or approaches to solving them. Nevertheless, we may be tempted to believe we know all we need to solve Dell's problem. For many of us, the cause of the problem and the solution are apparent: Kevin Rollins is to blame and should be replaced as CEO. Framing the situation this way simplifies the challenge. Instead of a lengthy and difficult task of defining, structuring, and analyzing the problem and then generating and choosing among potential solutions, we just reduce the problem-solving process to a choice between keeping and replacing Rollins. Regardless of what you would advise, you most likely zeroed in on a solution rather quickly.

Daniel Kahneman, psychologist and Nobel laureate in economics, explains in his groundbreaking best seller *Thinking, Fast and Slow* how we have two minds in one brain, constantly in contention over our mental operations.¹ Our default approach to thinking—including about how to solve problems—is fast. This is known as “System 1” thinking. System 1 thinking is largely involuntary, automatic, and unconscious. When thinking fast, we limit our attention to information readily available rather than search for information that could help us better understand the situation, a tendency Kahneman calls “What You See Is All There Is (WYSIATI).” Fast thinking is also associative: the limited information we initially have about a situation (and pay attention to) triggers a rapid and unconscious activation of related ideas we hold in memory, which trigger other associated ideas, and so on. The result of this cascading process is that we can quickly make sense of new situations, even though we have limited information, by constructing coherent stories about what is going on and what we should do. In other words, our brains excel at jumping to conclusions.

In contrast to fast thinking, slow thinking (aka “System 2”) is voluntary because it requires effortful attention and conscious deliberation. But this effort is cognitively expensive: mental capacity is a scarce resource, and we need to allocate it to the problem (thus the phrase “paying attention”). Consequently, in solving challenging problems, we often gravitate toward the law of least effort. One way we do this is to rely on the results of the faster and cognitively cheaper System 1 approach to thinking. Our deliberative System 2 thinking then merely endorses System 1's proposals. With sufficient effort

and skill, however, slow thinking can be logical, skeptical, and methodical, causing us to search for missing information, question assumptions and beliefs, and utilize tools and frameworks to make sense of a situation, resulting in a much better understanding of it and how to tackle it. But our brains only trigger slow thinking by exception, when fast thinking is ineffective at dealing with the situation at hand. Neuroscience research on problem solving bears this out: the region of the brain that is active when people solve problems quickly, based on beliefs, is distinct from the part that activates using deliberate logic, indicating that different mental processes are competing for control in problem solving.²

The temptation in the story about Kevin Rollins and Dell Inc. is to think (too) fast about the problem and solution or to be lazy in our slow, deliberative thinking. When presented with information about Kevin Rollins's tenure as CEO of Dell compared to the Michael Dell era—slowing sales growth, declining market share, missed earnings estimates, falling stock price, and so on—it's easy for us to take it at face value and believe we don't need to know more. Immediately, our brains go to work on detecting the associations among the information. An important point is that Rollins is a CEO. This is likely to trigger a belief most of us hold about leadership: that leaders can (or should) control the fate of the organizations they lead. Consequently, we attribute good performance to good leadership and bad performance to bad leadership. Connecting the dots between this association about leadership and the indicators of poor organizational performance, we quickly develop a coherent story about what's going on, and jump to a solution: fire Rollins.

But would we come to the same conclusion if we questioned the information and searched for more? For example, what if we learned that, despite Dell's declining stock price, it was still outperforming everyone else in the industry? Or that Rollins was widely respected and admired within Dell, even though employee confidence in other senior leaders was declining? What if we had additional insight into the causes of the problem? For example, Dell sourced the faulty batteries from Sony, a supplier that everyone in the industry considered reliable. What if we also learned that Dell lost its top spot in market share after HP acquired Compaq (another major producer of computers)? What if, in investigating Dell's declining market share further, we discovered it was due, in part, to flattening demand from its core enterprise customers and growing demand from end consumers, whom Dell wasn't adept at serving? Or to a decline in the value of customization, which was a core part of Dell's customer value proposition, because rapid advances in computer components resulted in standardized machines that were good enough to satisfy most customers? Would we analyze the problem differently if we discovered

Michael Dell had elevated Rollins to CEO to maintain the firm's strategic focus on enterprise customers and customization, rather than alter the company's business model to adapt to changing competitive conditions (as Rollins had, in fact, wanted to do)? Finally, what if we recognized that some symptoms, such as the SEC's investigation into Dell's accounting practices, resulted from decisions Michael Dell made during his tenure as CEO instead of choices Rollins made?

When we stop presuming we know what's going on, and instead question the sufficiency of the information we possess and search for more, we become more likely to overcome our assumptions and see the problem differently, enabling us to generate different and potentially better solutions. While it would be imprudent (and potentially disastrous) to believe we can develop an effective solution to the problem facing Dell in early 2007 without taking these steps, jumping to a solution was still easy to do.

Therein lies the core problem of problem solving—our tendency to think too fast (or too lazy) and jump to solutions. We spend too little time and effort understanding a problem, believing instead we know all we need. We unleash the associational machine in our minds, reflecting our implicit assumptions about causes and effects, on this limited information to develop a coherent and plausible story about what's going on and why. As Wharton professor Adam Grant explains in his book, *Originals*,³ people have no trouble turning any information they receive into a coherent narrative, even when the information is random. People can't help seeing signals, even in noise.

The danger is to believe the story we are quick to create, and to take action based on that story. Shakespeare's character Othello is the archetype of this tragic flaw. He resolves to kill his wife Desdemona when he sees in the hands of another woman the handkerchief he gave her as a token of love. This woman received it from Cassio, which suggests that Desdemona had given it to Cassio. As the traitor Iago has convinced Othello that Desdemona and Cassio are lovers, the handkerchief looks like hard evidence. The real story is that Desdemona dropped it inadvertently and Iago planted it in Cassio's lodgings. Because of assumptions and a false narrative, Othello kills Desdemona, who is actually faithful to him, thereby destroying the one worthy of his love. While the consequences may not be as tragic, we all run the risk to jump to conclusions and take action without questioning the implicit assumptions—or the emotions—that dictate the way we interpret events and information.

The remedy is to think about problems more thoroughly, search for missing information, double-check every clue, weigh the pros and cons, and investigate all possible hypotheses. To avoid Othello's mistake, however, we can be vulner-

able to becoming Shakespeare's perhaps most famous character, Hamlet. You may recall that Prince Hamlet is the son of the late King of Denmark, and his uncle Claudius (the King's brother) has usurped the throne by killing the King and marrying the widow Queen. The drama is about Hamlet's reluctance to avenge his father. Hamlet wants to be sure Claudius is guilty and kill him under legitimate circumstances. His endless hesitations paralyze him and drive him to commit irreparable mistakes. At the end of the play, the entire Danish royal family kill one another and Denmark surrenders to Norway, its archenemy.

So, are you Othello or Hamlet? Are you more likely to think—and act—too fast, or to get mired in analysis paralysis? While jumping to conclusions and actions is a widespread fault in individuals, analysis paralysis is frequent in large, bureaucratic organizations that pile up studies and reports before taking any action or no action at all. On the one hand, being fast or lazy in our thinking allows us to economize on scarce and expensive mental resources, but the resulting solutions are often poor and ineffective. On the other hand, slow thinking and thorough investigation are necessary to tackle complex business problems—the focus of this book—but the reflection process might create delays in decision-making and thwart action. For organizations and institutions to be both effective and efficient, they need people who can overcome these challenges to solving complex business problems. These people must be as thorough as Hamlet and as action oriented as Othello, without jumping to conclusions like the latter or being stuck in a loop of endless questioning like the former. Conventional wisdom suggests these people should be chosen for their intelligence, experience, and expertise. But as we'll see, being smart, experienced, and well-trained may not be enough. A systematic problem-solving method is also necessary.

Problem Solving and the Expertise Trap

We all solve problems. We couldn't make it through a day without tackling the steady flow of challenges life throws at us: "What's the most efficient route to avoid a traffic jam and get to work on time?" "Where do I take my out-of-town friend to dinner?" "How do I lose the pounds I put on during the holidays?" Technology can help solve our problems, but not always. Problem solving is a dominant form of how we think and one of our most complex intellectual activities. It's a core part of what makes us human.

While we all solve problems, managers and consultants are professionals—they're hired and paid to do so. Iconoclastic management scholar Henry Mintzberg, one of the first to study what managers do, found they spend

much of their time solving problems.⁴ Leadership consultancy Zenger Folkman recently surveyed over 300,000 managers and found that problem solving was the second most important competency at all management levels.⁵ The OECD Survey of Adult Skills showed that complex problem-solving skills are essential for fast-growing, highly skilled managerial, professional, and technical occupations.⁶

Management consulting firms, such as McKinsey, Boston Consulting Group, and Bain, *exist* to solve business problems. As Harvard professor Clayton Christensen recently observed, “Management consulting’s fundamental business model has not changed in more than 100 years. It has always involved sending smart outsiders into organizations for a finite period and asking them to recommend solutions for the most difficult problems confronting their clients.”⁷ No wonder that according to an internal McKinsey staff paper, problem solving is viewed as the most important skill for success in the firm.⁸ As part of their recruiting, management consultants carefully assess the problem-solving skills of their applicants through anxiety-inducing “case interviews”: during the interview, candidates are given a short description of a challenge facing a disguised client company and tasked with solving the problem. Some firms also use formal problem-solving tests: according to consulting prep website IGotAnOffer.com, only one-third of qualified applicants pass McKinsey’s test.

So how good are the professionals at solving challenging problems? We can look to research on expertise and problem solving for insight. Experts have developed in-depth knowledge within a particular domain through extensive study and practice, and have mentally organized their knowledge for easy recall and use. Managers and consultants typically specialize in particular functional or industrial areas for much of their careers, developing expertise in these areas. Research has found that for problems within their domain of expertise, experts have advantages over novices: they have more richly developed mental models of different problems and can better recognize and understand problems, often by using analogies to past problems.⁹ Experts also use more effective problem-solving strategies in their areas of expertise, more carefully evaluate potential solutions against constraints, and more effectively monitor their problem-solving progress by refining solutions.¹⁰

These advantages of expertise explain why research shows, for example, that when compared to novice accountants, seasoned tax accountants can more readily draw on their understanding of tax law and accounting conventions to solve a particular client’s tax problem.¹¹ They also explain why a lean manufacturing expert can walk into a manufacturing plant and quickly spot opportunities to increase efficiency by reducing work-in-process inventory that plant employees missed.

Expertise, however, is likely to be irrelevant to solving the problem facing Dell in 2007 and could even hamper it. This is because expertise comes with constraints. Even though experts are better problem solvers than novices within their areas of expertise, when they tackle problems outside their expertise or when task conditions in their fields change, they often perform like novices ... *or worse*. Experts' rich and detailed mental models can constrain their ability to understand problems and search for solutions when working outside their fields of expertise. Mental models are rigid and resistant to change, particularly when associated with successful outcomes. Experts can become trapped by their expertise. Psychologist and Rice University professor Erik Dane finds that the more expertise and experience people gain, the more entrenched they become in a particular way of viewing the world.¹² Compared to novices, experts also are overconfident in their ability to understand problems outside their areas of expertise, leading them to develop worse solutions.¹³

Finally, reasoning by analogy can also lead experts to develop poor solutions when faced with new but seemingly familiar situations. When reasoning by analogy, a person starts with a new, unfamiliar target problem to solve. She then considers other source settings she knows well and compares them to the target through a process of similarity mapping. By finding a source problem she believes has similar characteristics as the target, she identifies a candidate solution that solved or could have solved the source problem. The whole process may be summed up like this: "I've seen something like this before, so what worked there may work here." While analogical reasoning can be a valuable source of insight and creativity, it can lead to poor solutions when problem solvers develop analogies based on superficial similarities instead of deep causal traits. When problem solvers have deep experience in a particular domain, their knowledge is salient and easy to recall, which can lead them to pay more attention to characteristics of the new setting that seem similar and ignore those that are different, and to develop superficial analogies and poor solutions.¹⁴ Experience can be a poor guide when working outside your area of expertise or when the nature of your work changes.

Complex Problems and "Unknown Unknowns"

Expertise is a double-edged sword. Even relevant expertise is insufficient for some problems. Like the Dell example, many business problems are complex, ill-defined, and non-routine. Complex problems' many interrelated causes make them difficult to understand. An ill-defined problem is one where the current situation, desired outcome, and path between the two are difficult to

articulate. Complex problems are often initially ill-defined and typically non-routine. A non-routine problem has idiosyncratic characteristics: we face them infrequently and lack the opportunity to develop experience and expertise in solving them. The complexity of business problems often requires the integration of various domains of knowledge, exceeding the expertise of all but the polymath problem solver.

As problem complexity increases, solvers are more likely to face “unknown unknowns,” further challenging the value of expertise.¹⁵ Long before US Defense Secretary Donald Rumsfeld made the term famous in his 2002 press conference, the notion of unknown unknowns (commonly called “unk-unks”) was familiar to project management and engineering professionals.¹⁶ Although a cumbersome phrase, an unknown unknown simply means that a problem solver faces uncertainties in solving a problem she is unaware of. Faced with complex problems, we rarely know the right questions to ask. As Rumsfeld put it, “There are things we don’t know that we don’t know.” The more we are unaware of the factors that produce a problem, the more likely we are to be surprised when events happen that cause our solution efforts to fail.

Consider the case of entrepreneurship. Entrepreneurs identify valuable customer problems to solve in exchange for money. The extent to which an entrepreneur recognizes an important and widely held problem and develops a solution—a product or service—that is better than rival offerings increases the chances the venture will be profitable. Important and valuable customer problems are often complex and poorly understood by entrepreneurs. Instead of recognizing their ignorance and investing in learning from potential customers so they can discover what they don’t know, research shows that entrepreneurs often abide by the *field of dreams* principle: if you build it, they will come. CB Insights, a data analytics firm that tracks global venture capital investing, recently conducted a postmortem of over 200 failed startups and found the leading cause of failure (over 40 percent) to be insufficient market acceptance. These ventures developed offerings that didn’t effectively solve customers’ problems.

Banco Davivienda in Colombia is a case in point. In 2009, bank executives in Bogotá identified what they believed was a big problem worth solving: nearly 40 percent of the population had no bank account. In response, the bank introduced a stripped-down, inexpensive, and easy-to-use account that relied on the bank’s retail branch network. Despite aggressive promotion, there was little customer acceptance and the initiative was deemed a failure and abandoned. Project team members evaluated the failure and realized they’d done little to understand the nature of the problem they were trying to

address. Instead, they let their knowledge of existing customers and solutions distort their understanding of the problem.

Just because something is unknown, however, doesn't mean it's unknowable. Many unknowns are unknown because problem solvers fail to spend the time, effort, and resources to recognize the unknown aspects of a problem. In response to their failed effort, members of the Banco Davivienda project team acted like cultural ethnographers to better understand the challenges the unbanked faced with financial transactions. They immersed themselves in the daily lives of the unbanked by spending weeks living in the poor neighborhoods where their target customers lived, observing, and engaging in conversations. The team developed personas of prototypical customers that summarized the primary financial tasks they performed, and the motivations, behaviors, and frustrations associated with these tasks. From these personas, the team identified previously-unknown dimensions of the challenge the unbanked faced. The primary challenge was the enormous time it took—sometimes as much as a full day of travel and waiting—just to get cash and make a payment.

With this new understanding of the unbanked customer problem, coupled with knowing that nearly all Colombians have mobile phones, the team conceived of a different solution—a mobile phone-based wallet that would allow customers to send and receive payments from merchants without ever needing to visit a branch or use an ATM card. But there were still challenges. Even with their efforts to recognize unknown unknowns, the Davivienda team had to resolve now-known sources of uncertainty. As DaviPlata's executive director Juan Carlos Rojas Serrano observed, "DaviPlata was born without knowing exactly the scope of what we were about to embrace." The team has since resolved these uncertainties and the DaviPlata product has been adopted by hundreds of thousands of Colombians and rolled out to neighboring countries.¹⁷

What this discussion of expertise and unk-unks tells us is that, when facing complex business problems, having experience and expertise in the domain of the problem can be helpful, but there are limitations. Probably the most important limitation is that experience and expertise can create an illusion of understanding. In facing complex problems with unknown unknowns, experts may not recognize their ignorance and instead assume they know all they need to tackle the problem. As the Davivienda example suggests, such an approach can lead to poor solutions. Research shows that expertise can lead to overconfidence in the assessment of difficult decisions, exacerbating the WYSIATI tendency of fast thinking, and resulting in an unwillingness to investigate and analyze the problem. Expertise is necessary for complex business problem solving, but not sufficient.

The Need for a Disciplined Problem-Solving Process

If we can't rely solely on experts and expertise to solve complex business problems, what else can we do? Psychological research suggests raw intellectual horsepower can help. In a recent comprehensive analysis of 47 studies involving nearly 14,000 participants, people's general intelligence explained almost one-fifth of the variation in their effectiveness at solving complex problems.¹⁸ While intelligence matters, over 80 percent of complex problem-solving effectiveness is explained by other factors—smarter is better, but it isn't enough. This helps to explain why management consulting firms don't just strive to hire smart people and develop their expertise in specific areas, but also invest considerable resources in building their problem-solving skills through formal training and on-the-job coaching.

The ability to solve complex business problems is essential for managers and consultants and the organizations that employ them. This capability will become more important and valuable as organizations increasingly rely on fluid, cross-functional, and multi-disciplinary teams to tackle new business challenges. Even if your organizational context remains a traditional functional one, it's likely that at some point you'll be asked to lead or participate in a cross-functional problem-solving effort (if you haven't done so already). Your career success may depend on how well you contribute to solving such complex problems—your functional expertise, while valuable, won't be sufficient.

Because of the insufficiency of expertise and intelligence for complex problem solving, it may not be surprising that organizations find it difficult to recruit people with this skill set. Recruiters polled by the *Financial Times* consistently rank "the ability to solve complex problems" among the top five skills that matter most in MBA graduates.¹⁹ Bloomberg (publisher of *Bloomberg Businessweek*) surveyed organizations that recruit MBA graduates and found that, across the industries surveyed, the second-biggest skills gap recruiters faced was with candidates' problem-solving skills.²⁰ Another survey of company recruiters showed that the biggest skills gap in new college graduates was in problem solving and critical thinking.²¹ Organizations need effective complex problem solvers, but they tell us that our schools and universities aren't adequately developing this competency.

It's unlikely that technology will help us overcome this skills gap. Although technologies help us with many challenging problems, rapid advances in big data analytics, artificial intelligence (AI), and robotics won't make problem-

solving skills any less relevant or important. Many analysts are predicting the opposite. Rather than substitute for human labor and jobs, automation enabled by big data, AI, and robotics is likely to place a bigger premium on human problem solving. The World Economic Forum's 2015 Future of Jobs Report predicted that 36 percent of all jobs across all industries would require complex problem solving as one of their core skills by 2020—by far the most important skill identified in the report.²² The OECD Adult Survey data shows a similar increase in the demand for complex problem-solving skills across professions and countries.²³ Now and into the future, the ability to solve difficult problems and communicate their solutions will only increase in importance and value.

If expertise, intelligence, and technology aren't enough for solving complex business problems, then how can we do better? There isn't much we can do in the short term about our expertise, and even less we can do about our general intelligence. When we face non-routine complex problems, we can't rely solely on our expertise. We need to know *how* to reason, in a generalizable way, to solve complex problems, without falling prey to analysis paralysis. We also need to harness expertise and intelligence and overcome our powerful temptation to jump to ill-informed solutions. What we need is a disciplined and generalizable problem-solving method and a set of useful tools for each step of the process.

A disciplined method can help. Strategy consultants turn rookies into trusted advisors and then into CEOs partly by teaching them robust, general-purpose problem-solving techniques. Research confirms that solving problems isn't just a matter of raw intellectual horsepower: an analysis of 70 studies that investigated the influence of training methods on creative problem solving found that providing training in specific processes and techniques improved problem-solving performance.²⁴ Following a method matters for problem-solving performance.

* * *

Decades of social science research has identified a set of barriers to effective problem solving. If we want to be better at it, then we must understand these impediments and how to overcome them. In the next chapter, we'll introduce you to the most pernicious pitfalls of problem solving. In Chap. 3, we'll present a method to help you defeat them, and in later chapters, we'll walk you through how to use the method.

Chapter 1 in One Page

- Like our thinking, our problem solving can be “fast” or “slow”:
 - *Fast: WYSIATI (“What You See Is All There Is”); associative thinking; stories*
 - *Slow: logical; skeptical; methodical; investigative*
- Many business problem solvers over-rely on “fast” thinking and quickly jump to an apparently coherent interpretation of the situation and a possible solution:
 - *The new CEO looked like he was to blame for Dell’s problems, but when you consider the case carefully ...*
 - *Othello kills Desdemona because he jumps to the conclusion she is unfaithful.*
- The opposite problem, “analysis paralysis,” is dangerous too:
 - *Hamlet hesitates to avenge his father.*
- Expertise $\neq$ problem solving: experts rely on mental models from their domain of expertise, but can fail to recognize the limits of their expertise and become “trapped by expertise” when conditions change.
- Complex, ill-defined problems usually contain important unknowns we know of ...
 - *Banco Davivienda invested heavily in understanding the needs of the unbanked.*
- ... and some we’re not aware of:
 - *There are things we don’t know that we don’t know, “unknown unknowns.”*
- Human resource leaders and recruiters consider complex problem-solving skills essential:
 - *IQ explains only one-fifth of variance in problem-solving effectiveness.*
 - *Problem-solving skills will be more, not less, essential in the future.*
- Therefore, mastering an effective problem-solving method is a key asset.

Notes

1. Kahneman, D. (2011). *Thinking, Fast and Slow*. New York: Farrar, Straus and Giroux.
2. Evans, J.St.B.T. (2003). In Two Minds: Dual Process Accounts of Reasoning. *TRENDS in Cognitive Sciences*, 7(10), 454–459.
3. Grant, A. (2016). *Originals: How Non-Conformists Move the World*. New York: Viking.
4. Mintzberg, H. (1973). *The Nature of Managerial Work*. New York: Harper & Row.
5. Zenger, J., & Folkman, J. (2014, July 30). The Skills Leaders Need at Every Level. *Harvard Business Review Online*. Retrieved from <https://hbr.org/2014/07/the-skills-leaders-need-at-every-level>.
6. Organisation for Economic Co-operation and Development. (2016). *The Survey of Adult Skills: Reader's Companion, Second Edition*. Paris: OECD.
7. Christensen, C.M., Dina D., & van Bever, D. (2013). Consulting on the Cusp of Disruption. *Harvard Business Review*, 91(10), 106–115.
8. Davis, I., Keeling, D., Schreier, P., & Williams, A. (2007). *The McKinsey Approach to Problem Solving*. McKinsey Staff Paper, No. 66. July.
9. Pretz, J.E., Naples, A.J., & Sternberg, R.J. (2003). Recognizing, Defining and Representing Problems. In J.E. Davidson & R.J. Sternberg (Eds.), *The Psychology of Problem Solving* (pp. 3–28). Cambridge, UK: Cambridge.
10. Nokes, T.J., Schunn, C.D., & Chi, M.T.H. (2010). Problem Solving and Human Expertise. *International Encyclopedia of Education*, 5, 265–272.
11. Marchant, G., Robinson, J., Anderson, U., & Schadewald, M. (1991). Analogical Transfer in Legal Reasoning. *Organizational Behavior and Human Decision Processes*, 48(2), 272–290.
12. Dane, E. (2010). Reconsidering the Tradeoff Between Expertise and Flexibility: A Cognitive Entrenchment Perspective. *Academy of Management Review*, 35(4), 579–603.
13. Wiley, J. (1998). Expertise as Mental Set: The Effects of Domain Knowledge in Creative Problem Solving. *Memory & Cognition*, 26(4), 716–730.
14. Gavetti, G., Levinthal, D.A., & Rivkin, J.W. (2005). Strategy Making in Novel and Complex Worlds: The Power of Analogy. *Strategic Management Journal*, 26(5), 691–712.
15. Feduzi, A., & Runde, J. (2014). Uncovering Unknown Unknowns: Towards a Baconian Approach to Management Decision-Making. *Organizational Behavior and Human Decision Processes*, 124(2), 268–283.
16. Graham, D.A. (2014, March 27). Rumsfeld's Knowns and Unknowns: The Intellectual History of a Quip. *The Atlantic*. Retrieved from <https://www.theatlantic.com/politics/archive/2014/03/rumsfelds-knowns-and-unknowns-the-intellectual-history-of-a-quip/359719/>.