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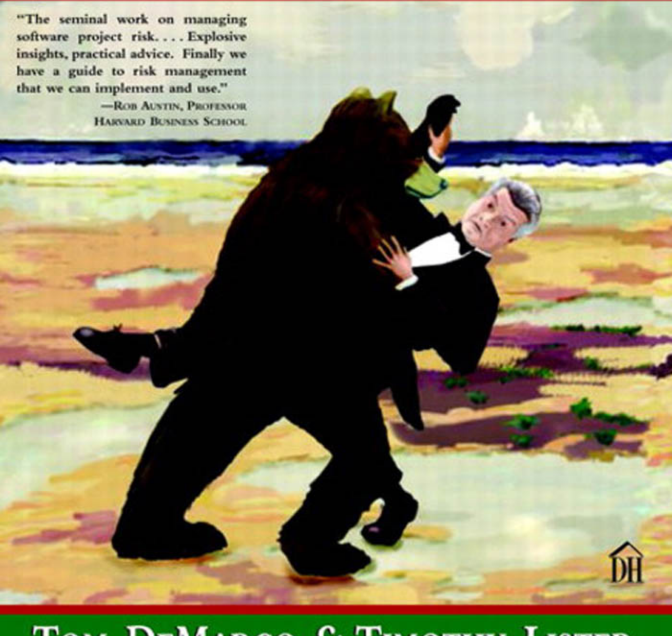

TOM DEMARCO & TIMOTHY LISTER

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Managing Risk on Software Projects

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We also want to thank our colleagues who have generously jumped at the chance to give us their opinions and insights pro bono. It is just these conversations that give us the joy of working in our profession. Our thanks go to Rob Austin, Barry Boehm, Christine Davis, Mike Evans, Sean Jackson, Steve McMenamin, and Mike Silves.

We especially thank Bob Charette and the late Paul Rook for trailblazing this area. Our path has been much easier to follow thanks to them.

Finally, we thank our consulting clients of the last ten years. These are the companies that demonstrated to us that running away from risk is a loser, and that risk comes with the territory of a valuable project. We recognize that these people are not afraid to work on risky efforts; they want to work on important ventures.

To Sally O. Smyth and Wendy Lister
Risk Managers Extraordinaire

AUTHORS' NOTE

This text is divided into five parts, each one intended to answer one of the major questions likely to be on the mind of a new or potential risk manager:

Part I: Why bother to do risk management?
Part II: Why shouldn't we do it? (Wherein the authors come clean about some of the potential negatives of introducing risk management into an organization that isn't quite ready for it.)
Part III: How shall we go about it?
Part IV: How much risk should our organization be willing to take?
Part V: How do we know whether or not our risk management approach is working?

The page introducing each new part breaks down the overall question into detailed questions. By reading the chapters in each part, you should find answers to all those questions—or we haven't done our job.

Voice

Most of the text is written in the plural voice, with "we" standing for both authors. On occasion, we like to get in a word or two in our individual voices, and that gives rise to paragraphs set off like these:

TRL: Here's me (Tim) speaking in my own voice.

TDM: And this one is me (Tom).

Website

As we mention later, in Chapter 12, we've built a Website to complement the text. You'll find it at

http://www.systemsguild.com/riskology

We have placed some tools there to help your risk management effort, and we will endeavor to keep the site updated as we learn about new risk management tools or news on the subject.

Our Title

Our title is taken from a song included in *The Cat in the Hat Songbook,* by Dr. Seuss.[1] The song tells of Uncle Terwilliger, who every Saturday night "creeps down our back stairs,/sneaks out of our house to go waltzing with bears."

Uncle T. is a willing risk taker—we can only hope that he has a workable understanding of risk assessment, containment, and mitigation. If so, he is a perfect model for managers of risky software projects, people who may need to dance on occasion with a few bears of their own.

[1]Dr. Seuss and Eugene Poddany, *The Cat in the Hat Songbook* (New York: Random House, 1967).

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PROLOGUE

THE ETHICS OF BELIEF

London, April 11, 1876: The scene is Grosvenor Square, just before 10 P.M. Around us, on the sidewalks of the square, Victorian gentlemen, many in top hats and evening clothes, are making their way toward the ornate entrance of the Grosvenor Hotel. We follow them in and are guided toward the upstairs parlor, where the monthly meeting of London's elite Metaphysical Society is to take place.

The Society's members include Alfred Tennyson, William Gladstone, Thomas Huxley, Cardinal Manning, Arthur James Balfour . . . in short, the cream of London intelligentsia. The subject this evening is, as always, philosophy. Before the proceedings begin, the participants are talking in small groups, picking up threads of the last meeting's discussion. As we wander among these clusters, we hear such terms as ontology, tautology, and epistemology. Some of the discussions are heated.

There is a certain tension in the room this evening, due to the selection of the meeting's featured speaker. He is the Society's newest member, William Kingdon Clifford. Clifford is a professor of logic and mathematics at London's University College. He is considered an iconoclast, possibly an atheist, and is known to be a fiery debater. With his selection, he has become the youngest person ever accepted into the Society.

By convention, each new member must prepare a paper and read it to the membership at his first meeting. Only the title of

Clifford's paper, "The Ethics of Belief," has been made public, not the paper's contents. It promises to be a stunner.

Indeed, before Clifford has even finished reading, half the room has stomped out in angry protest. The Society's Secretary has publicly resigned; it would have been his job to arrange a private printing of the paper, and this he has refused to do. The remaining members are on their feet, either cheering Clifford on or trying to shout him down. The temperature in the room has shot up markedly and the entire scene is, well, a bit *un-British.*

What was it about "The Ethics of Belief" that got the members so hot? In the essay, Clifford asserts that what you choose to believe ought not to be exempt from the ethical judgment of others. Your belief may open you to a charge of unethical behavior, depending on whether, in Clifford's words, you have "a right to believe" the thing that you believe.[1]

He offers as an example the owner of an emigrant ship that is about to set sail with a full complement of passengers. The owner is bothered by worries that the ship is old and in poor condition and wasn't built very well in the first place. There is a real question in his mind about whether it can safely make another passage. With a bit of effort, though, the shipowner overcomes his doubts and persuades himself that no great harm will come from just one more passage. The ship, after all, has weathered more than a few storms in its day and always managed to limp home to port. Why not one more time?

The ship puts to sea and is lost with all hands.

"What shall we say of the owner?" Clifford asks, and gives his own answer:

> *Surely this, that he was verily guilty of the death of those men. It is admitted that he did sincerely believe in the soundness of his ship; but the sincerity of his conviction can in no wise help him, because he had no right to believe on such evidence as was before him. He had acquired his belief not by honestly earning it in patient investigation, but by stifling his doubts. And although in the end he may have felt so sure about it that he could not think otherwise, yet inasmuch as he had knowingly and willingly worked himself into that frame of mind, he must be held responsible for it.*

---

[1] See Appendix A for Part 1 of "The Ethics of Belief."

Clifford then goes back over the same story and alters it slightly. Suppose, he tells us, that the ship had managed after all to complete the voyage with no loss of life. Would the owner have been less guilty?

> *Not one jot. When an action is once done, it is right or wrong forever; no accidental failure of its good or evil fruits can possibly alter that. The man would not have been innocent, he would only have been not found out. The question of right or wrong has to do with the origin of his belief, not the matter of it; not what it was, but how he got it; not whether it turned out to be true or false, but whether he had a right to believe on such evidence as was before him.*

Prior to Clifford, there was a presumption that your beliefs could never be considered in an ethical light. You could believe any damn thing you pleased. You could even believe impossible things, as the White Queen did in *Through the Looking Glass*. When Alice protests that one simply cannot believe impossible things, the Queen responds,

> *"I daresay you haven't had much practice. . . . When I was your age, I always did it for half-an-hour a day. Why, sometimes I've believed as many as six impossible things before breakfast."*

There is probably no job on earth for which an ability to believe six impossible things before breakfast is more of a requirement than software project management. We are routinely expected to work ourselves into a state of believing in a deadline, a budget, or a performance factor that time subsequently may prove to be impossible.

We do this in a process that's not so terribly different from when the shipowner talked himself into believing in his ship. You have almost certainly been through this process yourself one or more times. There may have been others, egging you on. Your boss, for example, asks you to consider taking on a project that has to be done by Christmas, with only three people available to work on it. You express doubts that there is enough time to get the software built.

"That's why I picked *you* to manage the job," your boss tells you, confidently.

The fix is in: You'll get the job, the challenge, and the prestige . . . but you'll have to believe in the schedule. That's the price you pay. You swallow hard and say you'll do it. Later, you bolster your belief. Sure, why not Christmas? Other projects have accomplished as much in as little time, haven't they? Before long, you may find yourself actually feeling confident. Time may prove otherwise, but for the moment, you are practically sure you can get the job done.

At that moment, though, William Kingdon Clifford's question should be coming back to haunt you. Yes, that's what you believed, *but did you have any right to believe it?* Did you have a right to believe in that schedule, based on the evidence that was before you?

The business of believing only what you have a right to believe is called *risk management*. This essential discipline applies Clifford's ethics of belief to any effort that is complicated by elements of uncertainty. It will guide you through that effort (a software project, for example) in a way that eliminates the fabric of little lies and self-deceptions that have so hampered your work in the past. It will become your alternative to believing "six impossible things before breakfast."

PART I

WHY

- Why manage risk—why not simply avoid it?
- What is a risk, and what is risk management?
- What are the consequences of unmanaged risk?
- Isn’t good process enough to take care of risks?
- Why do we need a new discipline?

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RUNNING TOWARD RISK

Running away from risk is a no-win proposition. Sometimes, you come across a project that looks positively risk-free. In the past, you may have looked at such an endeavor as a slam dunk and thanked your lucky stars to be given an easy project for a change. We've had the same reaction. What dummies we were. Projects with no real risks are losers. They are almost always devoid of benefit; that's why they weren't done years ago. Save yourself some time and energy and apply it to something worthwhile:

> If a project has no risks, don't do it.

Risks and benefits always go hand in hand. The reason that a project is full of risk is that it leads you into uncharted waters. It stretches your capability, which means that if you pull it off successfully, it's going to drive your competition batty. The ultimate coup is to stretch your own capability to a point beyond the competition's ability to respond. This is what gives you competitive advantage and helps you build a distinct brand in the market.

Flight from Opportunity

Companies that run away from risk and focus on what they know they can do well are ceding the field to their adversaries. The 1990's gave us some charming examples of this. There were, broadly speaking, two major things going on in the nineties:

1. Companies were moving applications and databases from the old mainframe-and-terminal mode to client/server mode.
2. Companies were transforming themselves to interact directly with their customers and suppliers in new and previously unimagined ways: via the Internet and through integrated supply chains, auction mechanisms, and disintermediated transactions.

Unfortunately, there were lots of companies that dedicated themselves substantially to the first of these and ignored the second. Once you've done one client/server conversion, the rest are easy and mechanical. You could do them in your sleep. In fact, if you spent most of the nineties doing client/server conversions, you *were* asleep. You missed the action.

A case in point is Merrill Lynch. It looked long and hard at the so-called trend of on-line trading . . . and decided to ignore it. It crossed its fingers in the hope that the era of the full-service brokerage (with fat fees and brokers who could keep you endlessly on hold) would come back, that direct trading would be only a passing fad. What a forlorn hope. Today, the full-service brokerage is as much a thing of the past as the full-service gas station. And today, Merrill Lynch offers its customers on-line trading at a reduced fee. But it took the company nearly a decade to catch on. Merrill Lynch was the latest of the Late Adopters.

The Early Adopters were Fidelity, Schwab, and E-Trade. E-Trade and its look-alikes were new companies, created to exploit the change. So, if on-line trading had turned out to be only a passing fad, E-Trade would have gone belly-up with no loss beyond the capital the company had raised explicitly to put at risk. Fidelity and Schwab, on the other hand, were well-established companies with a lot to lose. In this sense, they were not so different from Merrill Lynch. But Fidelity and Schwab were willing to take the risks.