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RESPONSE
ABILITY

Response Ability

The Language, Structure, and Culture of the Agile Enterprise

RICK DOVE

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To my wife and daughter I dedicate my life.
This book I dedicate to those who have inspired it,
those who have helped develop it,
and those who have encouraged its completion.

They are:
Steve Benson, Joan Bigham, Bob Dove, Steve Goldman,
Ted Goranson, Gene Guglielmo, Cy Hannon,
Sue Hartman, Paul Kidd, Chuck Kimzy, Charon Lohara,
Mel Pirtle, Ken Preise, Jack Ring, Larry Rhodes,
Orapong Thein-Ngern, and Gary Vasilash.

Each in some way helped cause this book.

Preface

This book addresses the practical and physical aspects of *how* to become agile. We do not deal with *why* or what to do with the *response ability* once you have it. There are already books dealing with these topics. People seldom perceive a problem in any tangible, actionable form until they appreciate that a solution exists—and then they begin to define and understand the problem in terms of the solution. Here, we will show the solution.

In 1991 I co-led an industry/government project at Lehigh University to identify the competitive frontier in 2005. This project gave birth to the concept of the *agile enterprise*. Our predictions were based on observations that the business environment was becoming less stable, that the driving forces toward more uncertainty were and would continue to accelerate, and that current organizations were not equipped to operate under these conditions. Our intention was to illuminate an inevitable future and motivate business organizations to begin preparing for it immediately and seriously.

This was an idea whose time had come: Others were thinking about the same inevitability, the consequences, and the strategies both for coping with increasing change and for turning this situation into advantage. Mass customization and organizational learning were two of the front-runners then—one a prescription for marketing and manufacturing strategy, the other a prescription for cultural strategy. At about the same time, tactical programs for change management and reengineering were sweeping through the business community, and lean manufacturing started removing the inertial fat.

As the 1990s progressed, more books were published with new ideas on how to cope with, and take advantage of, increasing uncertainty and accelerating market cycles. By and large, these books focused on

strategies for specific aspects of business such as business strategy, marketing strategy, manufacturing strategy, information technology, and knowledge management. Two books *Agile Competitors and Virtual Organizations* and *Cooperate to Compete,* written by Steve Goldman, Ken Preiss, and Roger Nagel, colleagues from the original agility project, took a broader enterprise view, creating a call to arms, illuminating a cross section of agile microstrategies being tested in various industries, and suggesting new priorities.

But still something was missing. New and valuable ideas and strategies must be implemented, changing some or all aspects of the organization. The real underlying message was that these changes, however advantageous they might be when made, would have to be changed all too soon thereafter.

How do you design an organization and all of its parts so that it is naturally agile—able to transform itself with competence into whatever the new situation requires? My research has focused on just that question. This research employed collaborative industry teams analyzing hundreds of highly adaptable business structures over an eight-year period, looking for common underlying fundamentals. We found them.

Being *able to respond* to proactive strategic direction, and being *able to respond* to reactive necessity, is what this book is about.

This book illustrates what it is that makes a business and any of its systems easy to change, and then demonstrates how to apply these principles to any system in a company, at any level. It shows you how to analyze opportunities and problems for their operational dynamics, and describes ways to use these tools to establish a solution strategy. It also demonstrates how to measure change proficiency, and how to use this tool for profiling a company and establishing improvement strategies. It then focuses on the role played by culture, and how to establish and insert these new values and competencies compatibly into an established corporate culture.

This is a book for those who want to know how things work under the hood: for leaders, for strategists, for change agents, for operational managers, and for business planners who seek knowledge as well as the tools for a persuasive edge. In the hands of such people, this book is also a supporting reference and tutorial for all others who will be part of the transformation.

■ TIMELINESS AND APPLICABILITY

When our 1991 investigation proclaimed accelerated and constant change as the coming business environment, it was an intellectual

concept that had not yet materialized. There was no emotional understanding in the business community. Since then, the scramble toward e-Commerce brought near panic to most established companies in many industries, as well as to the new fireflies whose five minutes of flame is extinguished as each new generation is born. E-Commerce is not the driving force behind this uncertainty and upheaval, it is only the first major wave coming from a deeper reality: the explosion and rapid application of new knowledge coupled with increasing connectivity and communication. True business complexity has arrived, and there is no going back.

E-Commerce provides a good current backdrop. Everyone understands the need for an e-Commerce strategy, but a company doesn't get an effective one without reengineering the organization considerably, and that's the hard part. An online order entry port is not what this is all about. E-Commerce is so new its broader possibilities are not yet explored. If getting a first e-Commerce strategy was a late wake-up call and cause for panic, getting another and another that is competitive will continue to cause panic for some time. Start-ups keep discovering new ways to redefine how e-Commerce can change the rules. Welcome to the twenty-first century.

To shift the focus away from e-Commerce, look at the satellite communications network business. Many of us watched Iridium's multibillion dollar 1999 bust, and turned our attention to Teledesic. But right in the middle of the Teledesic start-up comes a pronouncement[1] that manned aircraft on overlapping rotating schedules can provide sky-beamed communications services at considerably less cost than satellites. Whether that turns out to be pie in the sky or not, six months after that announcement comes one about a combination helicopter rocket,[2] which promises dramatic drops in satellite launch cost. New technology (knowledge) is threatening slightly-less-new technology with obsolescence even before it comes to market.

I will not talk much about e-Commerce or communications networks; but I will deal with how an organization can be made *response able* when e-Commerce requires a different organization, a different distribution logistics, a different production capability, a different innovation capability, a different set of resources, a different product design, a different service strategy, or a different approach to anything.

This book addresses the nuts and bolts and analytical side of organizational change proficiency. It clears the haze surrounding the concepts of business agility and the agile enterprise by showing the fundamental principles that underlie an organization's ability to respond, and by explaining how to apply these principles in real situations. It is the physics of the agile enterprise that is exposed here.

As a by-product, this fundamental viewpoint provides a strategic context for lean operating practices, puts knowledge management and the learning organization in perspective, and offers a framework for incorporating today's best advice on new business practices and strategic focus.

■ THE USER'S MANUAL

This book breaks many traditional rules. First, it attempts to speak both to enterprise leadership and to operational management—two audiences with different interests and different perspectives. Next, it speaks across the organization to various functional managers, each with a different viewpoint and strategic focus. The reward is that leaders understand the concepts and know that there is an implementation plan, that implementers respect the strategic context that justifies and guides implementation, and that managers understand that they all have something very much in common. The style of the book, also unconventional, attempts to make it fruitful for all.

The material in this book is both broad and deep. In some respects, it is written to the mythical business engineer and architect: that person who would know something about all aspects of the enterprise and take responsibility for enabling both leadership and viability under dynamic conditions. There may be times when this book doesn't speak to your experience base, when it gets too low in the organization or too high, when it gets too strategic or too tactical, or when it gets too social or too technical. If you plow through the unfamiliar terrain, you will find a common theme throughout and a common language and perspective that binds them all.

Reading this book may get your hands dirty. Many of the case examples are taken from the production floor, from product designs, and from information technology; and from the automotive, electronics, semiconductor, and aerospace industries. But there are also many examples that deal with other industries and service sectors, and illustrate organization design, supply chains, teaming, customer relationships, training tools, knowledge management strategies, knowledge worker relationships, and practically every other aspect of business.

As a learner, I need answers to my questions as they come to mind. You have in your hands a bound collection of paper that doesn't have a point-and-click interface as yet—so it is linear by nature. But like all such books, it does have a big advantage over today's on-screen text, hyperlinked or not—you can quickly flip through it

and, in the process, have some sense of what you are bypassing. This book has been crafted with that style in mind, and the understanding that we all learn differently.

If you are a visual learner, you can get a pretty good overview from a cursory scan of the graphics in this book, and a reasonable amount of detail by reading the captions. Some of you may get a sufficiently complete story from only the pictures and tables and never investigate the chapter text. Others will want to see the many different data points that create the final patterns.

Reading erratically is expected and encouraged. In the text, we generally discuss the nature of a problem before exploring our approach to a solution, often with anecdotes and metaphors, sometimes directly. If you already understand the problems, skip ahead. But if you do skip, and the solution doesn't make sense, step back and review the perspective on the problem. After an overview scan, the book will be comprehensible when taken in random bites.

This book employs examples from many companies, but leans heavily on specific examples from four different companies. You will see a pattern emerge that makes the material independent of any specific case. There are enough familiar examples here that the more obscure will bare their souls as the patterns emerge.

■ NOTES

1. C. Platt (1999), "Ethernet at 60,000 Feet," *Wired,* June, pp. 150–155, 208–209. "Already Proteus has made more than a dozen test flights in preparation for its ultimate mission: to cruise at 60,000 feet . . . where it can do the kind of tasks routinely done by satellites. . . . It could bring broadband wireless voice, interactive video, and data service to American consumers three or four years ahead of low Earth orbit satellite constellations such as Teledesic. . . . A city can be served by a fleet of three Proteus airplanes, each carrying a 15-foot communications dish beneath its curved belly. One plane will circle for 8 hours, providing telecommunications for an area 50 to 75 miles in diameter. As it runs out of fuel, it hands off to the next plane, and so on, enabling uninterrupted 24-hour coverage." All of Teledesic's $9 billion system needs to be up and running before services can be provided, but Proteus can dominate a major market as soon as it puts three planes in the air—at a cost of $30 million; using revenues to finance additional major market coverage and leaving the sparse areas for Teledesic when it finally arrives.

2. O. Port (ed.) (1999), "It's a Rocket! It's a Chopper? It's Both," *Business Week,* March 22, 1999, p. 65. "It looks like a huge traffic cone that has sprouted a palm tree. But the 63-foot-tall Roton is a hybrid rocket-helicopter that Rotary Rocket Co. hopes will slash the cost of putting

satellites into orbit—by as much as 90 percent . . . To make it happen, he [founder Gary Hudson] has created a lightweight vehicle that will use whirling rockets to climb into orbit, then descend for a soft touchdown by unfolding helicopter blades. Roton's 72 rockets whirl like a fireworks wheel to create centrifugal force. That pushes fuel into the rockets and eliminates the need for the heavy and expensive turbo-pumps otherwise required."

RICK DOVE

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I conducted some of the research for this book while I was associated with the Agility Forum. The nature of that association was collaborative by design, and so in addition to the Forum and its DARPA and NSF sponsors, all of the people and organizations who participated in the Forum's various discovery workshops have played important contributing roles.

In 1997 and 1998, I conducted a series of discovery workshops that focused on proofing and refining the 10 principles presented as the core material in this book. The participants in this series, along with their organizations, are due a special acknowledgment for their collaborative interest and serious thoughtful work, and in many cases, for the real-life examples provided in this book. They include:

- *Companies:* Agility Forum, Boeing Rocketdyne, Concurrent Technologies Corporation, Dupont, Eastman Kodak, General Motors, The Hartman Group, Innovation Management, LSI Logic, Lyceum Group, Miles Burke Technologies, Motorola, Pratt & Whitney, Procter & Gamble, Rockwell Avionics & Communications, and SAP America.

- *Participants:* Jack Adams, Leon Agnew, Mike Bell, Steve Benson, Lisa Bogusz, John Bricklemeyer, Al Beam, Rick Carrabello, Jim Cook, Mark Correll, Nicole DeBlieck, Bob Dove, Bill Drake, Dave Ervin, Al Hall, Sue Hartmen, Dan Henke, Pete Holmes, Jerry Hudson, Jim Hughes, Stephen Jacques, Mary Jane Kleinosky, Patrick Kraus, Howard Kuhn, Keith Kutner, Kent Longenecker, Joe Leone, Leland Leong, Joe Lichwalla,

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R.D.

Contents

Part One

Agility, Response Ability, and Culture

Part One of this book lays a foundation of concepts and leverage. Definitions attempt to clear up the slipperiness that the word agility acquires when applied to business and enterprise. The roles of culture and knowledge management are discussed. A common set of structural patterns is shown as the enabler for highly adaptable enterprise systems.

Chapter *1*

Putting Agility in Its Place

Agility is a word that has immediate and personal definition for almost everyone. It can capture cycle-time reduction, with everything happening faster. It can encompass mass customization, with customer responsive product variation. It can embrace virtual enterprise, with streamlined supplier networks and opportunistic partnerships. It can echo reengineering, with a process and transformation focus. It can demand a learning organization, with systemic training and education. It can build on lean production, with high resource productivity. As a descriptive word, agility can embrace almost any competitiveness interest with considerable intuitive appeal.

In this opening chapter, we establish some firm guidelines and definitions for examining agility and its enabling components.

■ BASIC CONCEPTS

Agility is not a brand-new concept. Ever since the first humans banded together for a purpose, organizations have existed in a changing environment that required adaptation. Like profitability, organizational adaptability is a core viability requirement (see Figure 1.1). To continue as a viable entity, an organization must meet two conditions: (1) It must generate at least as much fuel as it consumes (profitability) and (2) It must continuously adapt as necessary to changing environmental conditions. If either of these conditions is not met, the organization is threatened with extinction. In this sense, an organization is
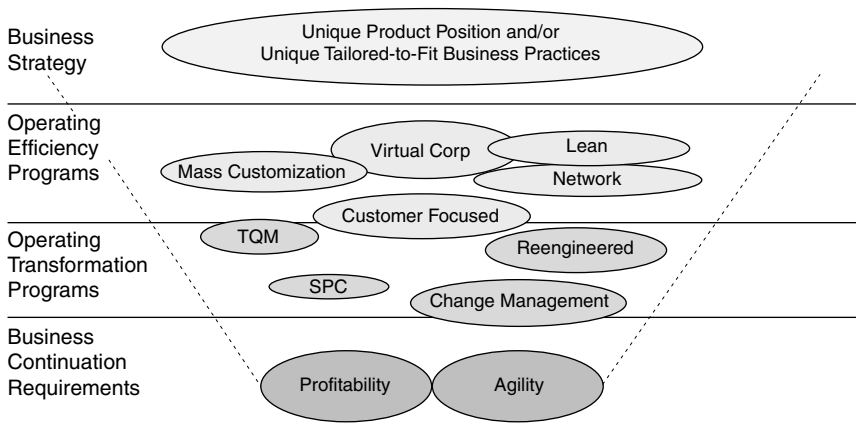
Agility Is an Objective, Not a Competitor, of Operating Programs

When agility first emerged as a competitive concern, it was confused by many as a repackaging of popular operating programs such as lean, TQM, mass customization, and virtual corporations. This confusion arose because the need was recognized before the means, and early attempts at describing supporting behavior borrowed operating modes and examples from existing programs. As a business continuation requirement, agility is not a new concept. The widespread difficulty is keeping up with a changing business environment. Though agility may also be wielded as a business strategy, that is an *option*.

Figure 1.1   Sorting Programs by Purpose
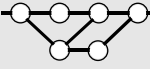
like an organism. Both lead a transitory life in a hostile environment that requires the consumption of energy and constant vigilance, followed by either adaptation or extinction.

In the life metaphor, we talk about evolution and mutation as ways to accommodate a changing environment, and we look for the enabling mechanisms in the genome of life. However, although the life metaphor has organizational lessons, we do not base the agile enterprise on it: Evolutionary life works within a much longer time frame than business. Life does not possess willful consciousness and the ability for leadership-directed mutation; and life on the grand scale knows no sense of pain or loss from its failed experiments. The proponents of biological and ecological metaphors[1] often go too far in their infatuation with mindless evolution and adaptation.

Efficiency programs[2] (e.g., lean production) and transformation programs (e.g., process reengineering) are all facilitated by an underlying proficiency for change. If the organization is proficient at change, it can and will adapt to and take advantage of unpredictable opportunity and will counter the unpredictable threat.

Being agile means being proficient at change. Agility allows an organization to do anything it wants to do whenever it wants to—or has to—do it. Thus, an agile organization can employ business process reengineering as a core competency when transformation is called for. It can hasten its conversion to lean production when greater efficiencies are useful. And, importantly, it can continue to succeed when constant innovation becomes the dominant competitive strategy. Agility can be wielded overtly as a business strategy as well as inherently as a sustainable-existence competency.

Agility is a core fundamental requirement of all organizations. It was not a conscious interest when environmental change was relatively slow and predictable. Now there is virtually no choice; organizations must develop a conscious competency. Practically all enterprises now need some method to assess their agility and determine whether it is sufficient or needs improvement. In this book I introduce techniques for characterizing, measuring, and comparing agility in all aspects of business and among different businesses. I offer methodologies for sensitizing a corporate culture to the values and modes of agile

Operating Architectures	Craft	Mass	Lean	Agile
Reconfigurable				⬤
Flexible			⬤	
Specialized		⬤		
Comprehensive	⬤			

Agility initially carried with it a manufacturing focus—a result of its birth in response to the Japanese success with new manufacturing approaches in the 1980s—in answer to early questions of how agility in manufacturing differed from flexibility and lean concepts agility was placed in the evolutionary continuum of manufacturing paradigms. This succeeded in helping many differentiate agility from older and more familiar ideas and in helping focus thought on the structural aspects of response-*able* systems. But it also lodged agility too firmly in the manufacturing environment and made it more difficult for some to visualize this concept in any and all aspects of enterprise organization. Worse yet, for some it cast agility as just one more operational paradigm—ignoring both the strategic and the fundamental places it timelessly occupies in the concept of enterprise.

Figure 1.2   A Manufacturing Metaphor for Agile Resource Relationships

activity and practice, and I suggest fundamental methods for increasing the agility of any business practice.

In the early 1990s, businesspeople wanted to know how agility differed from flexibility, or from the body of knowledge gathered under the *lean* rubric. These were (principally) manufacturing concepts, and agility initially, had a manufacturing focus—a result of its birth in response to Japan's success with new manufacturing approaches. In one of my own contributions to the confusion, I responded to these questions head-on, and placed agility in the evolutionary continuum of manufacturing paradigms: craft, mass, lean, agile (Figure 1.2). This characterization was a two-edged sword. It succeeded in helping (1) to differentiate new agile concepts from older and more familiar ideas, and (2) to focus thought on the structural aspects of "response-able" systems. But it also lodged agility too firmly in the manufacturing environment and made it more difficult to visualize this concept in any and all aspects of enterprise organization. Worse yet, it cast agility as just one more transient operational paradigm, ignoring both the strategic and the fundamental places that agility timelessly occupies in the concept of enterprise.

■ AGILITY DOES NOT COME IN A CAN

We may ascribe to the belief that self-organization and personal autonomy are required to navigate the turbulence of today's chaotic business environment, or that an organization cannot be successful if it lacks strong leadership and strong management. Do collaboration and team consensus offer the only way to success for an organization, or are competence and excellence compromised with consensus?

What people believe or know to be true is a product of their experience and environment and quite likely is proven true daily if their experience and current environment are in alignment. Autonomous operating concepts from complex adaptive systems (chaos) theory cannot be forced onto a polar-opposite organization that lives and breathes a command-and-control culture; and a culture that values unmitigated competency above all else cannot be persuaded that a committee consensus is the best way to make critical decisions. Conversely, a new manager who brings unquestionable procedural rules to a highly successful but independent and unpredictable creative team will either lose the team or be ignored; and an experienced team leader who is hired away from a company for his or her technical expertise may fail miserably in another company when he or she refuses to compromise ideals for the sake of team agreement.

Bill Schneider, a clinical psychologist focused on organizations, suggests that corporate cultures fall into one of four core categories: control, competence, collaborative, and cultivative.[3] Figure 1.3 shows one of his characterization maps. He argues that reengineering works when the underlying principles of new management practices are translated into concepts compatible with the underlying culture—and doesn't work otherwise.

In the early days of my proselytizing the agile enterprise concepts, one of my most poignant learning moments occurred when I addressed a group of a hundred or so manufacturing managers and executives at DuPont. The Q&A session opened with: "It's nice to know that you have all that theory about agility, but I need to know *what* to do. Tell me the five things to do!" I didn't know how many people he was speaking for, but this sentiment struck a dissonant chord deep inside me. I was sharing my most insightful thoughts about what managers had to consider when they chose a strategy, but I was talking to a person—or maybe many persons—who did not want to make that decision. This man did not even want to know what was behind a decision that someone else might make and hand to him. He wanted marching orders, and he wanted them quickly and simply. Production was what he lived for, and he kept it humming—at least while he was at work and not off listening to some academic gobbledegook. Welcome to the real world!

Schneider notes that in a corporation, a *core* culture of one type may coexist with other, even polar opposite, cultures in localized areas. My experience has been that manufacturing is a functional area that tends to favor the command-and-control operational culture, regardless of the core culture of the greater organization. Thus, what works within one part of the company may not work well in another, unless some cultural translation of the underlying principles is communicated.

When this agile *characteristic* was identified in the 1990s as a new and necessary competitive focus, there was immediate and impatient pressure within the manufacturing community to identify exactly how one became agile. An organization may exhibit this characteristic in many ways. *Agility* is not a brand name for management practice, business strategy, or manufacturing theory, though you may have *an* agile strategy, *an* agile practice, or *an* agile manufacturing capability. One company's effort to maintain this capability is likely to be very different from that of a similar competitor.

A football team exhibits agility. The quarterback tells the other 10 players on the field what the next play will be, and each player knows exactly how that play is supposed to unfold. Independent

Actuality — Impersonal

Leadership Focus
- Team builder—Coach
- First among equals—Participative
- Representative—Integrator
- Trust builder—Commitment builder
- Realistic—Ensure utilization of diversity
- Bring in the right mix of talent

COLLABORATION

Management Style
- Participative—Collegial
- Democratic—Relational
- Supportive—People driven
- Personal—Emotional
- Adaptive—Informal
- Trusting

Leadership Focus
- Authoritative/directive
- Maintain power
- Conservative/cautious
- Commanding—Firm/assertive
- Definitive—Tough-minded
- Shot caller—Realistic

CONTROL

Management Style
- Methodical—Systematic
- Careful—Conservative
- Policy and procedure oriented
- Task driven—Impersonal
- Prescriptive
- Objective

Personal — Possibility

Leadership Style
- Catalyst—Cultivator/harvester
- Empower/enable—Inspire/enliven
- Commitment builder—Potentializer
- Appeal to common vision—Steward
- Promoter/motivator—Maker of meaning
- Foster self expression

CULTIVATION

Management Style
- People driven—Personal
- Relaxed—Emotional
- Attentive—Promotive
- Nurturant—Humanistic
- Enabling/empowering
- Purposive—Committed

Leadership Style
- Standard setter—Challenge subordinates
- Set exacting expectations—Visionary
- Stretch people/push limits—Taskmaster
- Recruit the most competent—Incentivizer
- Emphasize what's possible—Architect of systems
- Assertive convincing persuader

COMPETENCE

Management Style
- Task driven—Objective
- Rational/analytical—Intense
- Challenging—Efficient/crisp
- Impersonal—Hard to satisfy
- MBO/MBR in nature
- Formal—Emotionless

Figure 1.3   Core Cultures and the Leadership/Management Focus

Source: William E. Schneider, *The Reengineering Alternative: A Plan for Making Your Current Culture Work.* This is one of five tables characterizing the four core organizational cultures mapped by Schneider, a clinical psychologist, who consults on organizational development and change. He argues that reengineering works when the underlying principles of new management practices are extracted and then translated into concepts compatible with the underlying culture. The vertical axis reflects what a culture pays attention to—the content—and ranges from *what is* to *what might be.* The horizontal axis reflects how a culture makes decisions and forms judgments—the process—and ranges from *impersonal analysis* to *personal/interpersonal involvement.*

ideas and play modifications are not tolerated. Once the ball is snapped, however, independent interpretation of what to do from one second to the next is expected. Fortunately, team members have a shared goal in mind and they all know where it is. Every player knows what competence and excellence mean in the role he is expected to play. Teams that do not simultaneously exhibit high group discipline and opportunistic individual innovation are not among the best. Teams that are not agile enough to fluidly seize unexpected moments, recover from unanticipated setbacks, or modify their game plan to fit an uncooperative competitor are not winners. How a football team manifests agility, however, may not work at all in a fundamentally different environment.

Agility does not come in a can. One size does not fit all. There are no five common steps to achievement. And there is not a simple set of four variations to match the Schneider cultural map. Cultural models map an infinite continuum and mixture of style into a few black-and-white categories. Cultural maps are highly useful to help us understand and develop variation of approach; but they are just sketchy reflections, not reality.

This book introduces fundamental principles and frameworks for examining your own need for agility and for establishing the requirements of appropriate solutions. It offers methodologies for involving as much of the organization as is appropriate in the development of these understandings and plans. It emphasizes that an understanding of the situation is necessary before solutions can be considered, evaluated, and selected, and provides methods for doing this. And it stresses the need and value of thinking and learning rather than blindly following a recipe.

■ KEY CONCEPTS AND TERMS

Figure 1.4 defines key terms as I use them in this book. This is done to eliminate ambiguity in the discussions. I do not pretend to have some authoritative claim over their absolute meanings. I have arrived at these meanings after many years of testing them in various ways—using them in working groups to describe concepts and build understanding—and have been guilty of using some of them interchangeably at different times as their evolution developed.

We look at *agility* as deriving from both the physical ability to act (*response ability*) and the intellectual ability to find appropriate things to act on (*knowledge management*). Agility is expressed as the ability to manage and apply knowledge effectively, so that an organization has