

## AGILE ENTERPRISE CORNERSTONES: KNOWLEDGE, VALUES & RESPONSE ABILITY

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**Abstract:** The concept of Agile Enterprise emerged in the early 1990s from a DoD/NSF-sponsored industry-collaborative study at Lehigh University. The intent was to forecast the competitive environment of 2005 and beyond. The accuracy of that work is evident in today's emerging business strategies, practices and technology-infrastructure support. In general, however, agility is creeping into the business environment, with compelling spot applications, such as outsourcing and business process management (BPM) initiatives. This paper examines new risk-management value-understandings, the nature of reality confronted by agile enterprise, and updates previously-published agile-enterprise system-engineering concepts. The purpose of this paper is to illuminate requirements for those who would design and build the necessarily-agile IT infrastructure support.

**Key words:** Agility, Agile Enterprise, Response Ability, Knowledge Management, Value Propositioning, Reality Factors, Business Process Management (BPM), Enterprise Risk Management (ERM).

### 1. PERSONAL EXPERIENCES

My purpose is to advance the state of knowledge of agile-enterprise *fundamentals* with this paper. Not much has been said in the literature of fundamentals and principles. Generally the focus has been on specific business practices, response-enabling and responsive infrastructure modalities, and much on agile programming. Fundamentals in specific areas have been addressed by Stephen Haeckel (1995, 1999) for sense-and-respond enterprise concepts, the KBSI TEAMWORK project (Benjamin et al. 1999) for adaptive-process analysis and modeling tools; "Manifesto for Agile Software Development" (Beck et al. 2001) for positioning extreme programming on principles, and spawning a community of practice; Anna Börjesson and Lars Mathiassen (2003) for case analysis of software improvement practices aligned to agile enterprise needs; IBM, Microsoft and Hewlett-Packard for infrastructure development and support tools; and Gartner and Meta Group for the important cultural-change vanguard-role they spearhead.

As there is little focus in the literature, or in practice, for fundamentals and principles of agile systems and agile enterprise, I will review the formation of my perspectives and subsequent research.

My interest in agile systems began in the 1980s, when I led a software company that introduced a CAD-like tool and object-oriented methodologies to the design of factory-wide control system. This had a profound impact on my appreciation for the role that architecture and design principles play in the integration of complex systems that must undergo continuous change.

In the early 1990s, I was co-investigator of a project at Lehigh University that identified agility as the competitive frontier (Nagel and Dove 1991), and subsequently set-up and led The Agility Forum's research agenda (Dove 1998). Choosing an industry-collaborative workshop approach, we analyzed existing flexible systems and the breadth of change they accommodated (Dove 1996). Purposely we involved people who were wrestling real problems in need of agile solutions, laboring under real constraints imposed by business and cultural reality. The collaboration involved over a thousand people in a few hundred organizations, over the course of approximately four years, and produced, among many other things, an Agile Enterprise Reference Model (Dove et al 1996). That work of The Agility Forum succeeded in influencing world-wide appreciation and attention is evident in current technology focus, business strategies, and academic pursuits.

In the late 1990s I continued with collaborative research to refine and verify agile design principles for business systems of all types, including business processes and corporate strategies as systems. I thought I was closing a life-chapter with the publication of these results in *Response Ability—The Language, Structure, and Culture of the Agile Enterprise* (Dove 2001b).

Along came a visionary CEO, starting up a major semi-conductor foundry business in Malaysia, with a green field opportunity to build a radically different enterprise strategy—one that wouldn't shackle pursuit of new opportunity in markets, business strategy, and business process. In my role as CIO, he wanted an enterprise IT infrastructure that would enable agile-ERP (enterprise resource planning) without penalty, and painless rapid interconnect to customers and suppliers with disparate systems. He also wanted real-time transparency with web-enabled access to all operational status, financial status, and project and production work-in-process. Many lessons were learned, but the most poignant was the need for a new agile-security strategy (Dove 2004b) demanded by the new potential for serious corporate damage—an inevitable consequence of agile enterprise.

This was followed by an interim division-presidential position at a company with metal rapid prototyping technology. The challenge was to transform an embedded R&D organization and culture into a semi-stand-alone enterprise; with some shared and many new business processes, and with a culture compatible with its agile technology and market opportunity.

Learning from these confrontations with business-change reality, my focus turned to agile business process management, agile cyber security, organizational and human behavioral reality, and decision-making behavioral factors (Dove 2005b). My earlier characterizations of agility needed a third dimension added to the two of *response ability* and knowledge management—that of value propositioning, as this is what determines decisions for action.

This paper addresses response ability, knowledge management, and value propositioning—as cornerstones of agile anything. Before looking at the cornerstones, context will be set by first looking at the basic value proposition for being agile, and then the reality factors of the business environment that must be addressed for effective agility.

## 2. THE VALUE PROPOSITION

Plain and simple, the value proposition for enterprise agility is rooted firmly in risk management—more specifically, *enterprise risk management* (ERM). The purpose of agility is to maintain both reactive and proactive response options in the face of uncertainty. Current ERM extends standard risk management strategies to a larger set of business risks, notably those of operations and project decisions—but is generally focused on risk analysis as it affects available choices. Half the story. The other half of risk *management* is to proactively increase the choice options with lower risk alternatives. Precisely the purpose of agility.

CIO Magazine's Scott Berinato, writing on ERM and its relationship to IT, says: "The reason these risks are suddenly being accounted for is because the systems are becoming ever more critical. Today, one bad IT decision can severely hamper—or even take down—a company." (Berinato 2004, p. 52) Decisions about IT infrastructure and business-process support affect the entire organization, with major operational impact—especially if they fail to perform as and when expected.

Rockwell-Collins, an aerospace company, is cited in that same CIO article as an early adopter of ERM decision-making procedures. They lost 20 percent of their revenue generation capabilities as a result of 9/11, yet

The company has turned a profit every single quarter after 9/11. And in January 2004, *Forbes* called Rockwell Collins the best-managed aerospace firm in America. ... "We're able to react [to that complex environment] because of our risk mind-set," says [CIO John-Paul] Besong. "With what happened to us, our *agility* was called to task. And we had the risk methodology in place to handle it." (Berinato 2004, p. 48)

They have clearly made the connection between agility and risk management.

Agility expands the options for response when unpredictable events occur—by reducing the cost of response, the time of response, the predictability of response, and the range of response. It does this principally through infrastructure, systems, and business processes that are structured for *response ability*. And, as will be shown, it is

not necessary to reengineer massively or disruptively to gain benefits—because the very nature of agile structuring supports graceful, incremental migration. Agility is, after all, about effective change management.

### 3. REALITY AND RISK

The *Enterprise Risk Management—Integrated Framework* (COSO 2004, p. 5) from the Committee of Sponsoring Organizations of the Treadway Commission contains the following caveat:

While enterprise risk management provides important benefits, limitations exist. ... limitations result from the realities that human judgment in decision making can be faulty, decisions on responding to risk and establishing controls need to consider the relative costs and benefits, breakdowns can occur because of human failures such as simple errors or mistakes, controls can be circumvented by collusion of two or more people, and management has the ability to override enterprise risk management decisions. These limitations preclude a board and management from having absolute assurance as to achievement of the entity's objectives.

These reality factors hurt precisely because they are insufficiently recognized when would-be-agile system and process requirements are established. If they are understood for what they are, and addressed with respect, they can be greatly mitigated and often precluded.

Seven areas of uncontrollable business-environment behavior were first identified by The Agile Security Forum (Dove 2004a). They were subsequently generalized as a framework of Reality-Factors for employment, along with other frameworks, in agile systems requirements development (Dove 2005a).

Reality factors stem from human behaviors and organizational behaviors, which can be whimsical, willful, vengeful, criminal, forgetful, distracted, expedient, unknowing, and otherwise act outside of what we wish they *ought* to do. According to Ashby's law of requisite variety, a system must be at least as agile as the environment with which it is expected to deal.

Although the reality-factors framework remains constant, the issues within are enterprise-situation dependent. We will look at them as they were identified for electric utility companies concerned with agile cyber-security strategies. The generalizations to any company with any agile-strategy concern should be transparent.

**Increasing pace of new technology**—Upgrading and replacing the IT infrastructure and applications is necessary for acceptable-practice parity, and increasingly demanded by regulatory bodies for cost containment and improved customer service. Yet we see new vulnerabilities in legacy systems still being discovered and exploited. Newer technology brings new and different vulnerabilities—that's what new technology does. Decreasing technology life cycles and increasing technology variety amplifies the situation. The historical record is undeniable—and demands appreciation and mitigation.

**Increasing complexity of systems**—The march is on for better integration of systems that support operations. Likewise for more network reach: network node count is growing and networks are interconnecting on larger scales with more sophistication. The complexity of software systems alone have long passed our abilities for analytical predictability. Networked business operations overlaid with a networked global community have added new combinations and complexity. We cannot predict with any assurance at all the results of a system change, no matter how small. Companies merge and race to interconnect; they upgrade, replace, and add new technology continuously; competition and opportunity drives evolving customer and supplier interfaces; and business operations are fragmenting and distributing business processes globally. The law of unintended consequences irrefutably expresses itself naturally in complex systems under change—and demands appreciation and mitigation.

**Creeping agile-business practices**—Whether an enterprise (an electric-utility, for example) considers itself agile or not, it cannot avoid outsourcing imperatives for IT, billing, call centers, and other business processes; nor electronic response-enhancing interconnects with energy suppliers, energy brokers, co-generators, demand-response customers, AMR (automated meter reading), SCADA (supervisory control and data acquisition) field assets, and wireless-linked field personnel. These alone don't constitute an agile enterprise strategy, but they are,

nevertheless, part of today's business strategy, driven by needs for better spot-responsiveness. Inescapable, yet each move brings new and greater security vulnerability—demanding appreciation and mitigation.

**Increasing globalization**—It is not a regional game anymore. Enterprises (an electric utility, for example) are outsourcing business processes off-shore, buying energy off-shore, and merging multi-nationally. Globalization brings more interconnected business operations—and with it, different ethics, different values, different perceptions of risk, different interconnected technology, and different nation-state interests. This means more sources of vulnerability, at the least. But economics and growth-pursuits will not be denied—and demand appreciation and mitigation.

**Natural human behavior**—Security impacts individual productivity and goal priorities. In so doing, it is often ignored or circumvented in actual daily decision making and practice. We humans are wired the way we are. We make decisions every day, all day long—as IT system administrators, as policy makers, as procedure followers, as users in all departments at all levels, and even as disgruntled employees. Our perceptions of what is right or expedient are biased by hopes and expectations, as well as the latest alligator that influences our immediate priorities and values. We are the source of human error. On top of all of this, we are whimsical. Rules are made to be broken, and they are, in any event, made for others who are less wise than we. Murphy's law is not a joke. And all of this just deals with people who are trying to do the right thing. But the perverse also exist. Optimal by-the-book actions and decisions do not and will not prevail anywhere—demanding appreciation and mitigation.

**Natural organization behavior**—Organizations are aggregates of natural human behaviors. On top of that, their is collective behavior different than individual behavior. Security impacts organizational productivity and goal priorities. In so doing, strategy is typically designed and deployed inadequately. Among decision makers there are inherent conflicts which remain unresolved, power politics and positions that exert biased influence, and competition for limited resources. Research shows (Cyert 1992; Simon 1997) that decision makers are ruled first by individual rather than group objectives, mitigate conflict by compromising greater values to achieve consensus, seek solutions that are acceptable rather than optimal, and vary risk-seeking and risk-averse behavior with economic conditions. Neither local optimality (within company or department) nor global valuation (for community or company) are standard characteristics of organizational decision making and behavior. It won't be changed. It is the nature of the beast—demanding appreciation and mitigation.

**Agile threat sources**—Ashby's Law of Requisite Variety demands that a response system be at least as agile as the environment that creates the need for response. Scourge technology has advanced to the point where we now refer to zero-hour attacks for the time it takes from release to massive Internet presence. Meanwhile the increasing sophistication of attack development and tool technologies has already reduced the time between vulnerability discovery and exploitation to mere days. Infected machines and public distribution of attack tools mobilizes massive resources quickly. Large scale grass-roots retaliation occurs when independent personal reactions weigh-in patriotically on national disputes or indignantly target companies on the wrong side of a thought-community. Amateur and professional alike benefit from this loosely-connected global collaboration of independent resources. These developments are less than three years old—more are on their way. As more value is made more available for theft and damage, the targets of opportunity become irresistible—demanding appreciation and mitigation.

#### **4. AGILITY CORNERSTONES**

Enterprise agility has three core enabling elements:

- accurate timely awareness that a change should be made, enabled by focused *knowledge management* processes,
- effective prioritization and choice-making among competing response-alternatives, enabled by *value-propositioning skills*, and
- a facilitated ability to change business processes and to customize operational responses in real time, which we call *response ability*.

## 4.1 Knowledge Management

Knowledge management is an overused term with broad interpretation, but with real meaning for the agile enterprise, as discussed in (Dove 1999). Knowledge about external and internal events and status that call for attentive response is the fuel of agility. "We should have known" is an off-hand observation of hindsight; but when the ability to respond exists, it becomes a glaring pain. Maybe it's inaccurate information-network knowledge that inhibits timely service restoration. Perhaps it's mismatched supply-demand realities that impact production capability. Possibly it's lack of operational or corporate transparency that runs afoul of Sarbanes-Oxley. Maybe it's lack of knowledge about new security threats and vulnerabilities, or a lack of knowledge about who needs newly available information or who needs obsolete knowledge corrected. In all cases, not knowing things that should be known is frustrating to managers, and met with decreasing tolerance by both stakeholders and law.

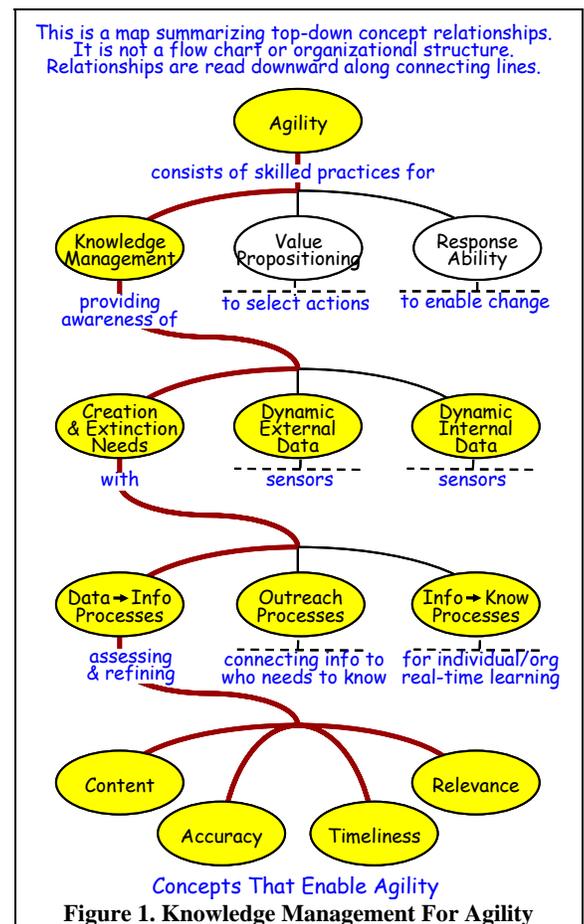
Figure 1 is a concept map of knowledge management aspects that support agile enterprise.

When knowledge management focuses on awareness it deals with distinctions between data, information and knowledge. Monitoring external and internal events and status produces data, and lots of it. That data becomes information when it is filtered for relevancy, timeliness, accuracy and content. But no action takes place on that information until it becomes meaningful knowledge, a very personal thing that resides in heads, not in data bases. Good awareness demands good sensors in both external and internal environments. With all of this sensor data, effective awareness must have processes for selecting and transforming data into information, providing that information to the right people, and helping them turn it into actionable knowledge.

Data has four distinct qualities. *Accuracy* and *Timeliness* can be facilitated, or even accomplished, with technologies and outside services. *Relevancy* requires thoughtful human intervention—for it needs an assessment that action is required. *Content* is a blend—for only a human can determine if everything needed for intelligent action is present, and what is needed to augment sensor data to complete the data-to-information process. These four qualities, by the way, are core concepts embedded in current U.S. Defense Department modernization strategies for warfighting—where real-time information superiority is the new focus (Garstka 2000).

## 4.2 Value Propositioning Skills

Timely corporate response, when a change is indicated, doesn't happen without a timely decision. But a fast decision is not necessarily a good decision—a crucial area overlooked in earlier agility research. A company that has developed good *response ability* has alternatives, which require intelligent choice-making based on insightful problem definitions and sound value propositioning skills—both on the part of decision makers and on the part of decision champions. Maybe it's a choice among new software solutions that have conflicting champions. Maybe it's a choice among alternate responses to new risks or security threats. Perhaps it's a choice between what to outsource and with whom, between different pricing initiatives, between different new services to offer, or between real-time operational response priorities. Decisions are much easier when there are few or no choices. Herbert Simon's Nobel



Prize winning work (1997) identified *satisficing* as a pervasive human psychological force which accepts the first alternative that satisfies stated requirements—explaining, but not excusing, why the best solutions are often not considered. Recent work on the human behavioral nature of decision making (Dove 2005b) points the way to better problem understandings, better value assessment, and better decisions.

Figure 2 is a concept map of value propositioning aspects that support agile enterprise.

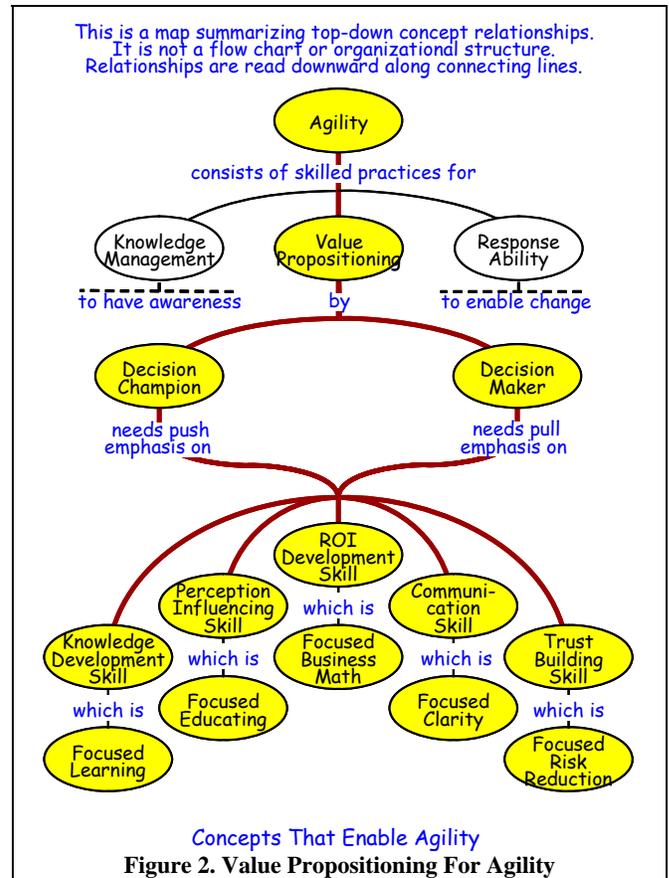
A decision champion's focus needs to be on the decision maker and how decisions are reached, rather than on the righteousness of the thing being championed. This understanding is especially lacking when technology is being championed, as both champion and decision maker are variously seduced, overwhelmed, impressed, confused, skeptical, and even repulsed when technology is the issue. Where technology projects or products are concerned, too often there is no acceptance of responsibility for crafting effective value propositions. There seems instead a belief that technology stands naked for all to see and evaluate, needing only a guided tour of features and obvious benefits, and that an inappropriate evaluation is a fault of the evaluator and not of the champion. I have shown elsewhere (Dove 2005b) that an effective value proposition is not about the solution, but rather about the problem and value perceptions of the people who will choose a solution.

The thing a decision champion must accomplish is to win approval from those who control corporate priorities and strategy, those who commit funds and resources. This may mean an engineering project manager winning approval for an internal development project, an account manager seeking selection as an external supplier of products or services, or a business manager seeking budget, capital, or strategy approval. In all cases the process is fundamentally the same. In this respect we see that some key responsibilities and skills of technically-focused people, business-focused people, and sales-focused people are identical (we pause while all parties shudder at this repulsive thought). They are all successful only to the extent that they can be effective champions of the projects and products they want decision makers to value and select. When they play the role of the champion effectively, they are indistinguishable. All face the same decision makers employing the same decision logic, and all win with the same skills, perspective, and argument strategy.

On the surface, a decision champion is the person seeking to show better value than all other alternatives. It is tempting to think that the champion therefore has more to lose if value is not perceived in its best light. But of course this is not true—all parties have a lot to lose. Both parties need the same basic skills, one with a communications-push emphasis and the other with a communications-pull emphasis.

### 4.3 Response Ability

The ability to change effectively, or rather its lack, tends to be the pain felt initially that creates a call for more agility. Maybe it's a project that overruns cost, takes much too long, fails to meet performance expectations, or simply wasn't approved because it can't be integrated into the current legacy environment. Perhaps it's an unexpected operational situation that overwhelms resources and capabilities. Possibly it's regulatory or compliance



requirements that can't be accommodated quick enough or affordably. Maybe it's rising risk or vulnerability that can't be mitigated responsibly, or an ugly merger/acquisition integration. Generally it is the inability to develop, support or change a business process effectively. Whatever, it is usually the sense of failure in the face of a needed or desired change that illuminates the need. This realization generally focuses an organization on the factors that inhibit change—the lack of *response ability*.

*Response ability* has three core enabling elements:

- a *culture of change proficiency*, molded by language for discussing and debating types of change and competency at change,
- a *system response architecture*, structured as Reconfigurable systems of Reusable modules in a Scalable framework (RRS), and
- a *process for change management*. with designated responsibilities for strategic business engineering and tactical change implementation.

**Change proficiency** is a competency facilitated or impeded by an organization's culture. Change proficiency is fostered, nurtured, and developed in organizations by people who recognize it as a worthwhile pursuit. It is practiced, refined, talked about, debated, valued, and taught; and seeps into the culture through this frequent exercise of language. The metric and change-domain frameworks shown in Figure 3 from a common language for change proficiency.

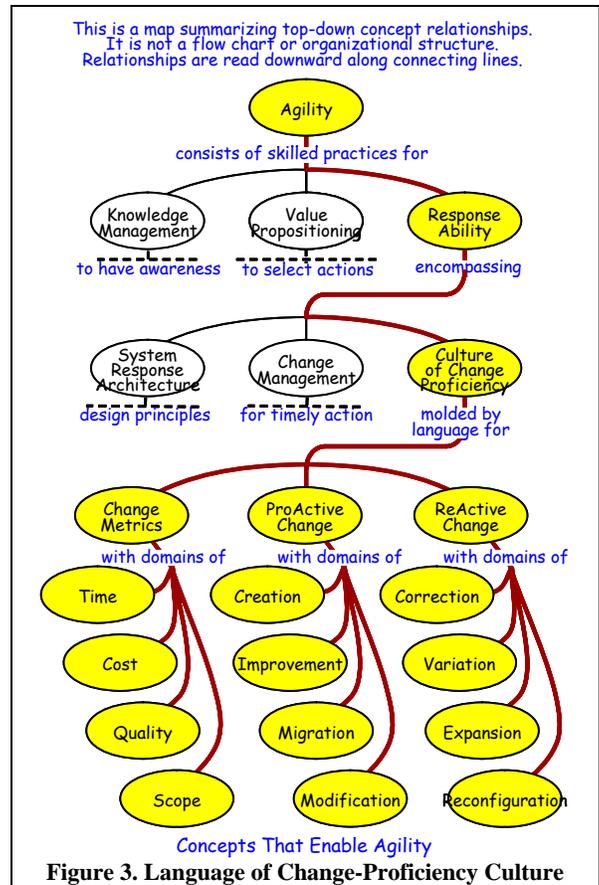
Naive discussion often confuses change proficiency with time and cost of change—when in fact quality, and scope of change are equally important. *Quality* demands a predictable and robust result, accomplished on time, on budget, and on spec. *Scope* is the principal difference between flexibility and *response ability*—measuring a capability for accommodating unanticipated change, rather than a fixed set of predefined options.

Understanding a problem space effectively requires an understanding of the dynamics that will constantly change its nature. A problem stated in today's immediate and static terms is a fleeting characterization, as the environment that causes and defines the problem will continue to change. An analysis framed to consider different types of changes forces problems to be understood in terms of their dynamics—whether the problem be a new market opportunity that needs developed, a merger opportunity that requires integration, a business process that might be outsourced, or simply an intolerable integration mess that needs fixed.

Table 1 shows an analysis framework structured into two general categories: reactive and proactive. A reactive change might be the response needed for new Sarbanes-Oxley compliance, a proactive change might be the initiation of outsourcing to reduce costs or provide new services.

**System Response Architecture**—A system is any organization of common-purpose interacting components: a team of people, a network of controllers, an IT ERP suite, a chain of suppliers, or an interrelated set of business processes. Defining key terms as used here:

- System: a group of modules sharing a common interaction framework and serving a common purpose.
- Framework: A set of standards constraining and enabling the interactions of compatible system nodules.
- Module: A separable system sub-unit with a self contained capability/purpose/identity, and capable of interaction with other modules.



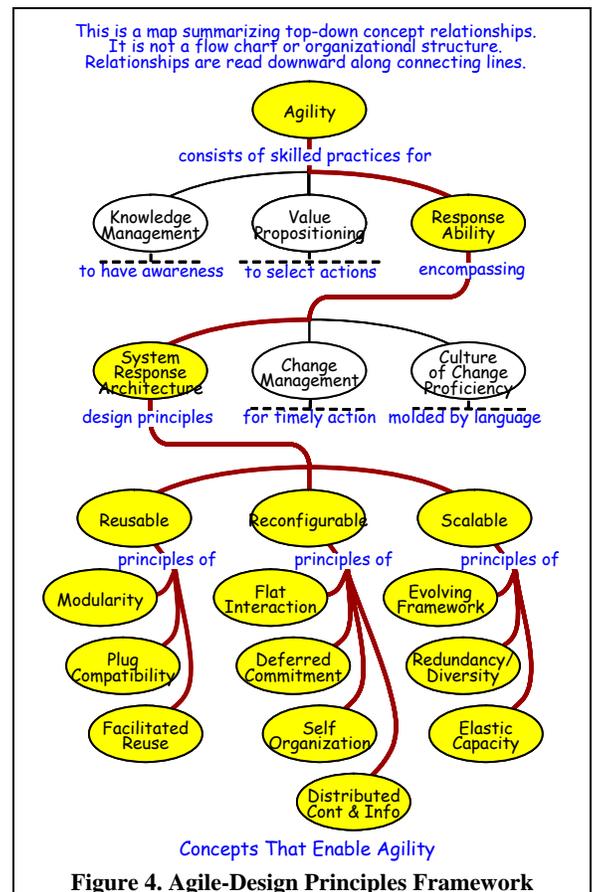
<b>Reactive change includes</b>
<b>Correction:</b> Rectify a dysfunction. Issues are generally involved with the failure to perform as expected, recovery from malfunction and side effects, and the rectification of a problem.
<b>Variation:</b> Real-time change within the mission of the solution space. Issues are generally associated with daily activity, performance adjustments, and interaction variances which must be accommodated.
<b>Expansion/Contraction:</b> Increase or decrease of existing capacity. Issues are generally involved with quantity and capacity changes, when either more or less of something is demanded or desired.
<b>Reconfiguration:</b> Reorganize resource or process relationships. Issues are generally involved with the reconfiguration of existing elements and their interactions, sometimes with added elements as well.
<b>Proactive change includes</b>
<b>Creation/Elimination:</b> Make or eliminate something. Issues are generally involved with the development of something new where nothing was before, or the elimination of something in use. This might be the creation of new products and services, a new corporate culture, new knowledge and skills, a new IT infrastructure, or a new operating strategy.
<b>Improvement:</b> Incremental improvement. Issues are generally involved with competencies and performance factors, and are often the focus of continual, open-ended campaigns.
<b>Migration:</b> Foreseen, eventual, and fundamental change. Issues are generally associated with changes to supporting infrastructure, or transitions to next generation replacements.
<b>Modification:</b> Addition or subtraction of unique capability. Issues are generally involved with the inclusion of something unlike anything already present, or the removal of something unique.
<b>Table 1. Response-Dynamics Issues Framework</b>

Hundreds of various systems exhibiting good *response ability* in business environments were analyzed by working groups at the Agility Forum in the 1990s. Common design principles enabling good response were identified and subsequently refined (Dove 2001b). The conclusion was that response-able systems are reconfigurable systems of reusable modules in a scalable framework, employing principles shown in Figure 4. Key is attention to parsimony in framework design, and attention to requisite variety in module population—two prime principles of good systems engineering.

Classic examples of response-able systems employed in a variety of business environment are covered at length by (Dove 2001a, Dove 2001b), and exhibit the principles expanded in Table 2.

**Change Management**—Response-able systems are just that—*able*; but they must be developed, utilized and maintained purposely by people with designated responsibilities for their benefits to be realized. These functions come with both strategic and tactical responsibilities. Strategic responsibilities plan for and initiate systems change; and at the highest level would rightfully belong to an office of business engineering. Tactical responsibilities affect systems change, through management and implementation of the change process, which I will call change engineering.

On the *business engineering* side, *change policy* establishes and maintains the proactive risk management options, and demands that a culture of change proficiency be implemented. *Knowledge portfolio change* ensures that an organization has the knowledge it needs, when and where it needs it, and requires that someone manage the organizational knowledge portfolio. *Strategic business process change* recognizes responsibility for monitoring and determining when a new or different process would be advantageous. *Strategic IT change* is responsibility for corporate standards and policy—and especially about infrastructure frameworks and security. *BP-IT framework change*



is responsibility for the prudent evolution of both IT-infrastructure frameworks and business process frameworks.

<b>Principles enabling reusability</b>
<b>Self-Contained Modules</b> - Modules are distinct, separable, self-sufficient units cooperating toward a shared common purpose.
<b>Plug Compatibility</b> - Modules share defined interaction and interface standards; and are easily inserted or removed.
<b>Facilitated Reuse</b> - Modules are reusable/replicable; and responsibilities for ready re-use/replication and for management, maintenance, and upgrade of component inventory is specifically designated.
<b>Principles enabling scalability</b>
<b>Evolvable Framework Standards</b> - Frameworks standardize inter-module communication and interaction; define module compatibility; are monitored/updated to accommodate old, current, and new modules; and are minimized (parsimonious).
<b>Redundancy and Diversity</b> - Duplicate modules are employed to provide capacity right-sizing options and fail-soft tolerance; and diversity among similar modules employing different methods is exploited, with attention to requisite variety.
<b>Elastic Capacity</b> - Module populations may be increased and decreased widely within the existing framework.
<b>Principles enabling reconfigurability</b>
<b>Flat Interaction</b> - Modules communicate directly on a peer-to-peer relationship; and parallel rather than sequential relationships are favored.
<b>Deferred Commitment</b> - Module relationships are transient when possible; decisions and fixed bindings are postponed until immediately necessary; and relationships are scheduled and bound in real-time.
<b>Distributed Control and Information</b> - Modules are directed by objective rather than method; decisions are made at point of maximum knowledge; information is associated locally, accessible globally, and freely disseminated.
<b>Self-Organization</b> - Module relationships are self-determined; and component interaction is self-adjusting or negotiated.
<b>Table 2. Agile-Design Principles Framework</b>

Change engineering elements mirror those in business engineering, but at the tactical project level. Some are triggered by the business engineering elements, and some are triggered by operational practices. Change procedures responsibility ensures that change proficiency concepts are employed, lest expediency or unfamiliar change-situation encourages an ad-hoc procedure. Knowledge development responsibility facilitates exposure, collaboration, and learning. Business process integration responsibility respects the complexity of business process interaction, ensuring that unintended consequences do not arise when a business process is changed. Information technology integration responsibility is accountable for integration management and the maintenance of response architecture principles—regardless of whether integration activity is outsourced or performed internally. BP-IT modules responsibility manages module change in all frameworks—maintaining module inventory, developing or acquiring new modules, and configuring and employing when systems must be customized or assembled.

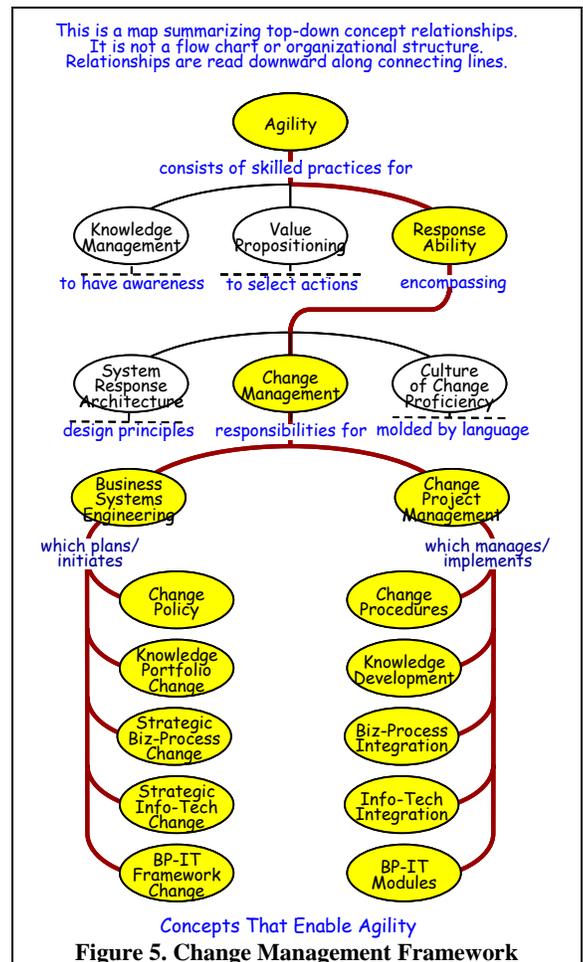
Figure 5 shows the Change Management Framework.

#### 4.4 Where Should an Organization Start?

The progression of typical response activity at companies not yet agile is generally from

- (1) awareness that response is indicated to
- (2) evaluating and deciding upon the best action to take to
- (3) implementing the response

Yet the progression of competency development is generally the reverse. Though this may seem backward, it is a natural course



in typical reactively driven business environments. An inability to affect a management-demanded change first stubs its toe on intractable processes and infrastructure. Once these are made *response able*, it becomes evident that successful responses were not-often-enough the best responses to make—then the processes of decision making and value assessment come under scrutiny. When these are honed, it then becomes evident that the awareness of decision-triggering events needs improvement.

Working backwards through these three steps removes roadblocks that provide immediate, though attenuated, value at each step. Whereas working forward cannot provide value until all three are in balance. However, these statements are only true when looking at total-enterprise agility. When a specific department or process is the focus, it may well be that the lack of timely information is the roadblock, rather than effective decisiveness or response implementation. There is ample evidence that incremental successes in process reengineering, working one area at a time, is a much surer way to corporate-wide success. For one, the incremental process provides proof of values and methods to other areas with high resistance and inertia. For another, it can attack high-payoff, fast-result, low-cost areas to build momentum and convert skeptics. Importantly, it narrows the focus to a few variables rather than the complexity and variability of corporate-wide infrastructures and processes.

## 5. CONCLUSION

Agility is a strategic objective that must co-exist in harmony and synergy with other objectives, priorities, and capabilities, whether at enterprise or departmental level. It is enabled by infrastructure, business processes, and strategic policy; but in the end, it is limited by the visceral knowledge and values of change proficiency held by all involved. Agility can't be bought in a box—it must be actively practiced as a mind set. And to be effective, it must be fit to the specifics of the organizational needs and realities.

The need for enterprise agility is rooted in enterprise risk management. The effectiveness of enterprise agility is rooted in reality-factors mitigation. The enablement of enterprise agility is rooted in infrastructure *response ability*—because reality rules, and a necessary path of graceful, incremental migration is that reality.

Graceful, incremental migration is necessary because few companies can take a time out for massive reorganization. Graceful, because awkward attempts will derail the appetite for transformation. Incremental, because it reduces perceived risk. Developing the *response ability* aspect of agility first demonstrates a compelling capability asset that demands to be leveraged. Its presence creates pressure for better knowledge management and better value propositioning, instigating the transformation to agile enterprise

*Against The Gods—The Remarkable Story of Risk* (Bernstein 1996, p. 1) suggests that "the revolutionary idea that defines the boundary between modern times and the past is the mastery of risk: the notion that the future is more than a whim of the gods and that men and women are not passive before nature." ... or passive before the reality of the enterprise environment. Agility converts the future from an enemy into an opportunity.

Football has response statistics down to a science: 3.9 seconds for the quarterback to put the ball in play, or likely failure. We don't yet have similar relevant performance metrics, or response-timing awareness, for enterprise agility, or for IT agility. Clearly there is much yet to do on fundamental understandings for agile enterprise.

## 6. REFERENCES

- Beck, K., Beedle, M., van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, A., Jeffries, R., Kern, J., Marick, B., Martin, R., Mellor, S., Schwaber, K., Sutherland, J. and Thomas, D. "Manifesto for Agile Software Development," 2001 (available on line at [www.AgileManifesto.org](http://www.AgileManifesto.org)).
- Benjamin, P., Erraguntla, M., Mayer, R., Marshall, C. "Toolkit for Enabling Analysis and Modeling of Adaptive Workflow (TEAMWORK)," *ACM SIGGROUP Bulletin* (20:3), December 1999, p. 9.
- Berinato, S. "Risk's Rewards," *CIO Magazine*, November 1, 2004, pp.46-58.
- Bernstein, P. *Against The Gods—The Remarkable Story of Risk*, New York: Wiley 1996.

- Börjesson, A. and Mathiassen, L. "Organizational Dynamics In Software Process Improvement: The Agility Challenge," in *IT Innovation for Adaptability and Competitiveness*, B. Fitzgerald and E. Wynn (Eds.), Boston: Kluwer Academic Publishers, 2004, pp. 135-156.
- COSO. "Enterprise Risk Management—Integrated Framework," Committee of Sponsoring Organizations of the Treadway Commission, 2004 (available online at [www.coso.org/publications.htm](http://www.coso.org/publications.htm)).
- Cyert, R. and March, J. *A Behavioral Theory of the Firm*, Oxford: Blackwell Publishing, 1992.
- Dove, R. *Design Principles for Highly Adaptable Business Systems, With Tangible Manufacturing Examples*, Maynard's Industrial Handbook, New York: McGraw-Hill, 2001a
- Dove R. "A Framework Driven Procedure for Developing Agile-System Requirements—With an Agile-Security Strategy Example," unpublished paper 2005.
- Dove, R. "Frameworks for Analyzing and Developing Agile Security Strategies," Santa Fe, NM: The Agile Security Forum, 2004a (available online at [www.AgileSecurityForum.com/docs/AsfPaperSixFrameworks.pdf](http://www.AgileSecurityForum.com/docs/AsfPaperSixFrameworks.pdf)).
- Dove, R. "Knowledge Management, Response Ability, and the Agile Enterprise," *Journal of Knowledge Management*, Bradford: Emerald Group Publishing, March 1999, pp. 18-35, (available online at [www.parshift.com/Files/PsiDocs/Rkd9Art1.pdf](http://www.parshift.com/Files/PsiDocs/Rkd9Art1.pdf)).
- Dove, R., "Realsearch—A Framework for Knowledge Management and Continuing Education," in *Proceedings IEEE Aerospace Conference*, Vale, CO, March 1998 (available online at [www.parshift.com/Files/PsiDocs/RealSrch1.zip](http://www.parshift.com/Files/PsiDocs/RealSrch1.zip)).
- Dove, R. "Rectifying the Security Gap," Santa Fe, NM: The Agile Security Forum, 2004b (available online at [www.AgileSecurityForum.com/docs/AsfPaperConceptCall.pdf](http://www.AgileSecurityForum.com/docs/AsfPaperConceptCall.pdf)).
- Dove, R. *Response Ability—The Language, Structure, and Culture of the Agile Enterprise*, New York: Wiley, 2001b.
- Dove, R. "Tools for Analyzing and Constructing Agile Capabilities," Bethlehem, PA: Agility Forum, January 1996 (available online at [www.parshift.com/Files/PsiDocs/Rkd4Art4.pdf](http://www.parshift.com/Files/PsiDocs/Rkd4Art4.pdf)).
- Dove, R. *Value Propositioning—Perception and Misperception in Decision Making*, Tucson, Arizona: Icen Books, 2005b.
- Dove, R., Hartman, S., and Benson, S. "An Agile Enterprise Reference Model, With a Case Study of Remmele Engineering," Bethlehem, PA: Agility Forum, 1996.
- Francis, J. (2004) *The Use and Value of Standard Operations Reference Models in an Adaptive Enterprise*, BPX Summit Proceedings, San Diego,
- Garstka, J. "Network Centric Warfare: An Overview of Emerging Theory," Alexandria, VA: Phalanx, Military Operations Research Society, December 2000, (available online at [www.mors.org/publications/phalanx/dec00/feature.htm](http://www.mors.org/publications/phalanx/dec00/feature.htm)).
- Haeckel, S. H. *Adaptive Enterprise: Creating and Leading Sense-and-Respond Organizations*, Boston: Harvard Business School Press, 1999.
- Haeckel, S. H. "Adaptive Enterprise Design: The Sense-and-Respond Model," *Planning Review* (23:3), 1995, pp. 6-42.
- Nagel, R., and Dove, R. *21st Century Manufacturing Strategy: An Industry-Led View*, Coolingdale, PA: DIANE Publishing Company, 1991.
- Simon, H. *Administrative Behavior* (4th ed.), New York: Simon & Schuster, 1997.

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