



# The premise and promise of sense and respond

By Stephan H. Haeckel

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## Key Topics

**Helps you meet the challenges of discontinuity with a sense-and-respond model**

**Explains the benefits of a sense-and-respond management approach in industries with rapidly changing customer needs**

**Defines the behavior of sense-and-respond organizations in probing and adapting to environmental change**

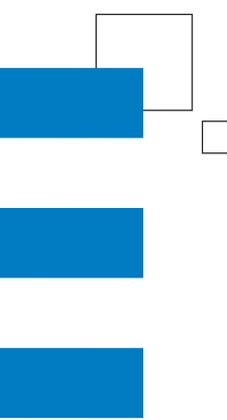
**Provides a leadership model for successful sense-and-respond organizations**

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Between May 1994 and November 1998, more than 3,000 executives from a variety of industries, government agencies and educational institutions attended strategy courses at the IBM Advanced Business Institute. All were asked a question deeply relevant to the future survival and success of their organizations: What kind of change do you expect your organization to face during the next decade? Fifty-two percent replied that their future business environment would be one of "continuous discontinuity." Another 25 percent foresaw "a one-time discontinuity, followed by continuous but incremental change." More than three-quarters of these senior managers, in other words, expected to face discontinuity and the challenge of guiding their large, complex organizations through an increasingly unpredictable future.

These executives' conclusions accord with the realities encountered by many firms during the last decade, especially those in information-intensive businesses. In the late 1980s and early 1990s, leading computer firms, including Wang, Digital and IBM, experienced drastic, unforeseen changes that threatened not only their industry leadership but their survival. Of these three, only IBM remains a major independent player. Similarly, financial institutions have faced and continue to face the challenges of deregulation and electronic commerce. As early as 1985, executives at Westpac, Australia's largest bank, after interviewing senior executives of several global banks, were unable to find anyone who felt able to predict reliably what new products and services customers would favor even one year in the future.

Peter Drucker was one of the first business thinkers to call attention to the growing certainty of uncertainty. He made very clear its implications for planning and strategy when he wrote, "Uncertainty—in the economy, society, politics—has become so great as to render futile, if not counterproductive, the kind of planning most companies still practice: forecasting based on probabilities."<sup>1</sup>



To survive, organizations must prepare themselves to deal with such a future. As Drucker suggests, however, traditional planning is useless in the face of great uncertainty. The essential question organizations must answer is this: What must we do—in fact, what must we become—if we are to successfully navigate the treacherous waters of unpredictability?

### **Meeting the challenges of discontinuity**

When asked to describe their strategies for coping with discontinuity, the executives polled at the Advanced Business Institute named many prescriptions from recent management literature: re-engineering, team structures, identifying core competencies, outsourcing, value-based leadership, lean and flexible manufacturing, customer relationship management, and so on. Discussions of these approaches brought out three underlying themes: business focus must shift from products to processes and competencies; individuals close to the firing line must be empowered; and customers' needs must receive increased attention.

It is not difficult to understand the appeal of these prescriptions. The efficiencies promised by re-engineering, lean manufacturing and outsourcing may, in fact, be essential to success; and customer focus and empowerment, as we will see, are necessary ingredients of adaptiveness. But, even collectively, they are insufficient, because they are almost always piecemeal attempts to deal with a problem that calls for a systemic, transformational solution. Given the fundamental differences separating the Industrial Age economy from the Information Age economy, only a fundamentally different kind of business organization will suffice. Continuously discontinuous change demands a new business model. The dominant large corporations of the 21st century will succeed only by embracing new concepts, not by better executing the old ones.

The sense-and-respond model provides a means for meeting the challenges of discontinuity. A sense-and-respond organization does not attempt to predict future demand for its offerings. Instead, it identifies changing customer needs and new business challenges as they happen, responding to them quickly and appropriately, before these new opportunities disappear or metamorphose into something else. Adaptability has come to be increasingly valued in recent years, and the terms flexibility, agility and responsiveness crop up frequently in business discussions today. Most people have yet to come to grips, however, with the deeper implications of adaptiveness: To be truly adaptive, an organization must have a fundamentally new structure; it must manage information in a particular way; it must be managed as a system; and its leaders and employees must commit themselves to very different behaviors and responsibilities. Traditional organizations cannot just add adaptiveness to their current set of capabilities. They must become adaptive organizations.

In other words, no acquired tips, habits or techniques will transform a traditional organization into an adaptive one. Instead, large organizations must challenge long-established concepts of leadership, strategy and responsibility. The basic questions to ask are these:

- What do the new economic realities imply for the structure and behavior of large organizations?
- If it is possible for large, complicated organizations to adapt rapidly and systematically to discontinuous change, how should they do so?
- What does strategy mean in an environment of discontinuous and unpredictable change, an environment in which future demand for products and services is intrinsically unknowable?
- What role must leaders play in empowered, decentralized organizations if the organization is to achieve coherent, enterprise-level behavior?

To understand the necessity for a new organizational concept and what would be its essential characteristics, let's begin by contrasting it with the more familiar idea of what a business is and does—the Industrial Age make-and-sell model.

### Make-and-sell vs. sense-and-respond

The simplified representation in Figure 1 illustrates two very different ways of thinking about business. Neither is right or wrong. A model is right if it corresponds to the level of predictability of the world in which a given firm operates.

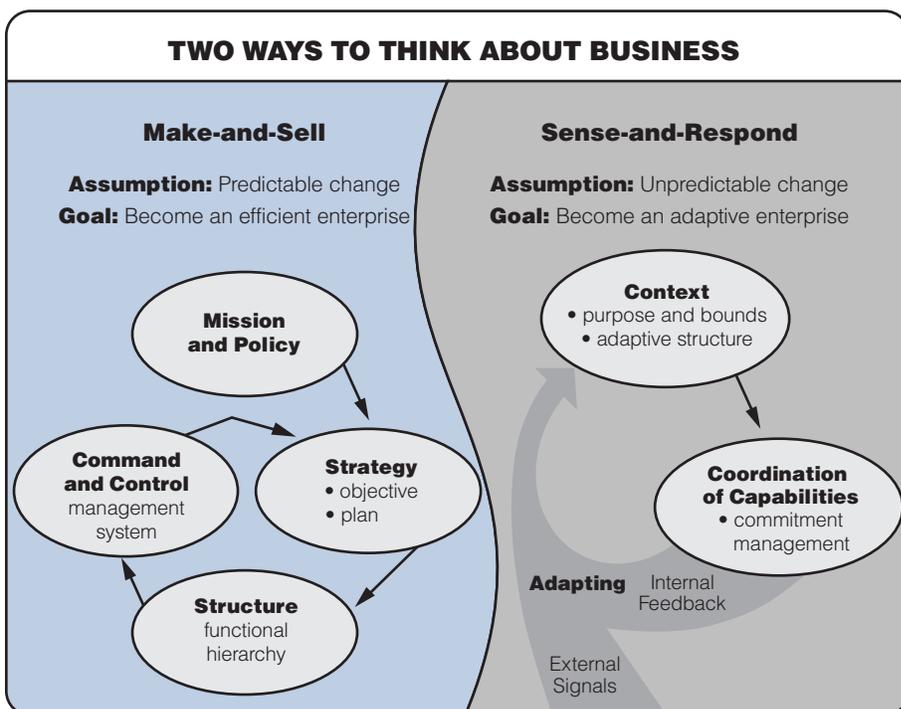


Figure 1

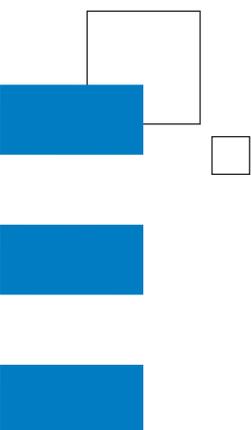
Where change occurs gradually and incrementally, for example, a sensible management approach would stress efficiency in doing what management already knows should be done: forecasting what the market will want, and minimizing the cost and expense of making and selling it. Such a business will articulate its mission and policies and regard them as a constant, as its North Star. These basic declarations will rarely be modified, because doing so would be disruptive, and disruption is the enemy of efficiency. Leadership in a make-and-sell organization operates in a closed system, ignoring for as long as possible signals that a change may be required. It articulates strategy as a set of objectives and a broad plan of action to achieve them. Although management will revisit the strategy once or twice a year, the company's course and speed will be kept as steady as possible, with some mid-course corrections. When dramatic changes in strategy are espoused, they will be resisted in the interest of avoiding the substantial cost in time and money required to "turn the ship around."

Structure-follows-strategy organizational design maximizes the efficient execution of the firm's strategy. Changing the strategy is disruptive and inefficient, because it means changing the structure—and reorganizing—with all the attendant breakage and relearning costs. Rather than undertake that, management keeps the ship on as even a keel as possible, issuing directives from the bridge on what to do and seeing that employees learn the repeatable procedures designed to maximize the efficiency of operations.

But in unpredictable markets, in which customers themselves become unreliable predictors of their future needs, adaptiveness must take precedence over efficiency. Premiums now flow to those who sense early and accurately what their customers currently want and who respond in "real time" to those needs—individual customer by individual customer. To enable this behavior, leadership in the sense-and-respond organization must create a context that unambiguously establishes what the firm does and the constraints on how it does it.

Leaders must also specify how employees interrelate to achieve the organization's purpose. The elements of the context thus established can be seen as analogous to the traditional concepts of mission, policy and organization but with important differences, to be described later. As long as employees stay within the parameters defined by the context, the business empowers them to determine for themselves how best to deliver the results for which they have been made accountable. The organization becomes a pool of modular capabilities that can be dynamically combined and recombined to respond to the current requests of individual customers.

Because it has more information about individual customers, the business can differentiate its value proposition from customer to customer. Its strategy is expressed in the form of an adaptive organizational design for dispatching modular capabilities in response to current customer requests; "reorganization" is continuous. Commitments, tracked using a commitment management governance system, define the dynamic interactions between capabilities. Context and coordination replace command and control. As individuals in the organization adapt to differing customer requests, always staying within the current organizational context, leadership actively seeks out environmental and internal signals that will help it improve the organizational context itself.



The successful large corporations of the 20th-century Industrial Age have been make-and-sell organizations. Automobile manufacturers, appliance manufacturers, and even the computer makers of past decades were superbly organized to produce large quantities of products efficiently and then sell them to customers whose needs they could assume, predict or even, to some degree, control. Henry Ford created the archetype of make-and-sell corporations: the assembly-line manufacturer turning out large numbers of identical items with machine-like efficiency. Human workers in Ford's world functioned as parts of the machine, each carrying out a specified, unvarying sequence of tasks. In fact, the appropriate metaphor for make-and-sell companies is efficient, offer-making machines. Like most machines, such firms are designed to consistently carry out particular purposes in predefined ways. They are characterized by replaceable parts, economies of scale and replaceable people executing repeatable procedures in accordance with prescribed business plans. Many large industrial corporations, including General Motors, General Electric, Johnson & Johnson and IBM, became great because they could anticipate demand, efficiently making and selling products in tempo with predicted changes in customer needs—and often enough shaping those needs themselves through marketing.

When customer needs change rapidly and unpredictably, however, this make-and-sell model begins to break down—as many large firms have discovered in recent years. It does not matter how good you are at making widgets if the market for widgets disappears or if your competitors offer dramatically new and improved widgets faster than you can. Even if make-and-sell firms could find ways to better track their customers' rapidly shifting preferences, they could not retool or rebuild their complicated production machines quickly or efficiently enough to keep up.

Interestingly, even as the profits of the giant make-and-sell enterprises confirmed the validity of the Industrial Age business model, a sense-and-respond model developed in the professional services industry. Systems integrators such as Bechtel, Fluor, EDS and the IBM Federal Systems Division (the forerunner of today's IBM Global Services organization) demonstrated as early as the 1950s that responding flexibly to unpredicted, individual customer requests could fuel profitable growth. Rather than schedule activities to produce predetermined offerings, these firms dispatch capabilities to produce unique responses to one-off requests for proposals. Customer requests, not a predetermined business plan, determine what they do and how they deploy their resources.

### **Thinking customer-back, not firm-forward**

Sense-and-respond firms operate from the "customer-back," not from the "firm-forward." Individual customer wants or needs constitute the engine driving the company's operations; they set the firm in motion. The customer occupies the center of the sense-and-respond universe. In make-and-sell companies, the plan comes first, driving operations from the firm forward. Most make-and-sell companies do invest in market research aimed at fine-tuning their products and gathering requirements for new offerings, but such research relies heavily on predictions, focusing on what is common among many customers rather than what is different about individual ones. Individual needs become homogenized as market segments, and new products target the most attractive segments. The firm, its plans and the efficiency of its productive processes remain at the center of the make-and-sell universe.

Ultimately, of course, all companies are customer-dependent. If potential customers choose not to buy what a firm sells, the firm will eventually fail. But when customer needs are stable, predictable or controllable, businesses can afford to look inward, focusing on what they do to meet those needs and how to do it efficiently. As long as their targets move slowly enough, these companies can refine a precision mechanism that will hit bull's-eyes over and over again.

When customer needs become unpredictable, firms, to survive, must move their center of attention to understanding those changing needs. Adaptive organizations require, first of all, a systematic ability to search out, capture and interpret clues about emerging and as-yet-unarticulated customer preferences. They must employ equal vigilance both in sensing developments that might enable new capabilities and in anticipating environmental changes, such as regulatory or political dynamics. Like athletes in the ready position, sense-and-respond firms must excel at sensing subtle change earlier and in responding to it faster than do their competitors. Such firms can establish reinforcing cycles of success that provide profit and drive change at a pace rivals can't match.

Sense-and-respond does not always mean listen-and-comply. "No bid" should be the response to a customer request that, even after negotiation, is not a good fit of the customer's needs with the firm's capability to respond profitably. Sense-and-respond can also mean anticipate-and-preempt, to use Adrian Slywotzky's term for its proactive form. In this case the firm invests in gathering and interpreting contextual data about changes in customer preferences. Businesses that get very good at doing this, as the online grocery company Peapod or the bookseller Amazon.com seek to do, may come to know more about their customers' preferences than the customers themselves do.

### **The adaptive loop**

A four-phase adaptive loop defines the crucial behavior of sense-and-respond organizations. Both adaptive individuals and adaptive organizations first sense changes in their environment and internal states. They next interpret these changes in the context of their experience, aims and capabilities, separating threats from opportunities and discarding irrelevant information. Next, they decide how to respond and, finally, they act on their decisions. The progression from sensing to interpretation to decision to action becomes an iterative loop as the adaptive system monitors the results of its previous actions and picks up environmental changes that have occurred since the previous cycle.

Organizations of all kinds, including make-and-sell firms, follow these basic steps to adapt their behavior. Even make-and-sell firms change over time. But they try to stay in the act phase as long as possible, relying on learning curve effects to increase their profits by improving efficiency as they do the same things over and over again. This motivates make-and-sell firms to resist change. They behave like closed systems, only responding to environmental change when it becomes too great to ignore. Sense-and-respond organizations, on the other hand, are aggressively open systems. Rather than ignore environmental change, they probe for new signals, cycling through the adaptive loop as quickly as possible to leverage the changes they sense into new and profitable responses.

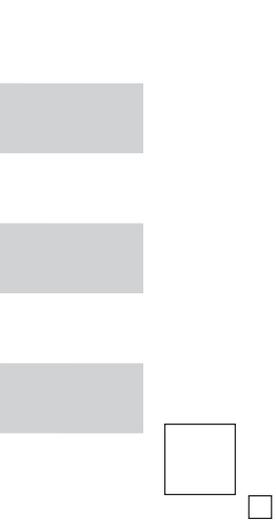
No organization, of course, can interpret, let alone respond to, more than a fraction of the flood of signals that pours in from the environment. Where organizations choose to place their sensory probes and how they distinguish meaningful signals from random noise determines whether they will be sufficiently aware of what is happening “out there.” Once aware, they must dispatch capabilities from their repertoire. Although information technology plays an essential role in this process, human skill in recognizing patterns and thinking creatively about unanticipated challenges will continue to mark the difference between successful firms and unsuccessful ones.

### **The search for coherence**

Command-and-control governance is a signature characteristic of classical make-and-sell organizations. Using the resources of large central planning staffs, senior management decided what employees should do and told them when and how to do it. The staff orchestrated the decision-making process and monitored compliance. In well-run companies, the command-and-control system ensured coherent organizational behavior by cascading instructions down the organization’s hierarchy. The plan determined interactions among organizational units. The linear sequence thus created, aptly termed the value chain, required minimal communication among functions. From the planners’ point of view, it didn’t much matter that development never talked to marketing. Their relationships were predetermined. The system’s inherent inflexibility—the industrial equivalent of a military machine—ensured coherence.

Such systems no longer work. The central planning groups that capably formulated and followed up on plans in a stable environment proved unable to do so when faced with rapid change in an increasingly unstable environment. When their efforts to keep up with unforeseen change created delay and bureaucratic burden rather than meaningful direction, most large organizations dissolved them. Moreover, leaders could no longer see clearly what actions employees should take. To cope, they began distributing decision-making power to units and groups more in touch with “what was happening out there.” Some leaders communicated policy decisions to mid-level managers, leaving them to develop appropriate actions. Some communicated only the company’s vision and values, trusting the empowered groups to figure out, somehow, how to turn that vision into reality.

But communicate-and-hope, even when supplemented by a financial model, does not constitute genuine governance. Broad directional statements by leaders, without a central staff to interpret them and monitor organizational behavior, are unlikely to produce the coherence needed by large, complex enterprises. No wonder that recent interviews of senior executives in two of the world’s largest companies revealed dissatisfaction with “lack of accountability,” “too many visions,” “lack of synergy” and “poor execution.” It could hardly be otherwise. When hundreds, even thousands of managers throughout large, complex global organizations are empowered to make their own decisions and interpret their leadership’s vision in their own way, the failure of these organizations to achieve coherence should come as no surprise. In their efforts to become more flexible, many organizations have simply become more chaotic.



Leaders of successful sense-and-respond organizations must skirt these pitfalls. How can they govern their organizations to ensure both coherent organizational behavior and responsiveness? A few business thinkers who believe complexity theory provides the answer argue that leaders have no substantive role. These theorists point to the many natural systems that self-organize to achieve important results. Large flocks of birds, they note, behave in a strategically coherent manner, migrating thousands of miles without benefit of an avian CEO to develop a strategy and issue instructions. But some important differences between complex social systems known as human organizations and the natural systems studied by complexity scientists undermine this conclusion. For now, it is sufficient to note that the few large, self-organizing businesses that do exist exhibit an underlying simplicity that distinguishes them from most large corporations. Though interesting, these examples tend to disprove rather than to support the idea that large, complex firms can self-organize to carry out a specified purpose.

Leaders of sense-and-respond organizations can ensure flexibility and coherence through a new approach to governance called “context and coordination.” Sense-and-respond leaders must first create, promulgate and enforce an unambiguous organizational context. Second, they must develop a system of coordination to govern—but not dictate—individuals’ behaviors to ensure they are consistent with the organizational context.

### **The leader’s role: providing context and coordination**

The word *context*, popularly taken to mean information providing an explanatory background, has a much more specific meaning in the sense-and-respond model. Organizational context encompasses three basic parts:

*Reason for being.* Unlike typical mission and vision statements, which propose a (sometimes inconsistent) mix of goals and principles, a reason-for-being statement unequivocally defines the organization’s primary purpose—the one outcome that justifies its existence. It also identifies the primary beneficiary of that purpose and any absolute constraints on how it is to be achieved.

*Governing principles.* These principles set forth the organization’s unbreachable limits of action, including what its members must always do or never do in their pursuit of the firm’s purpose.

*High-level business design.* A high-level business design is a system design of the organization’s essential structure. It illustrates the relationships among elements both inside and outside the organization in terms of the outcomes they owe one another—the outcomes essential to achieving the enterprise’s reason for being.

Together, these three components of context tell accountable, empowered people where the organization is headed, define the boundaries on their actions, and draw a picture of how what they do relates to what others do and to the organizational purpose. A well-articulated context provides an unambiguous framework for individual activity, aligning and bounding organizational actions without dictating what those actions should be. It leaves empowered individuals free to choose the best responses to unanticipated requests within a unifying framework of unambiguous purpose, principles and structure.

Developing and adapting organizational context is the primary responsibility of leadership. This creative process differs considerably from the problem-solving activities that many senior managers still consider their principal work. It calls for dramatically different skills. The rigorous intellectual exercise of context building depends on leadership's ability to develop viable conceptual business models—an ability rarer than talent for putting out fires.

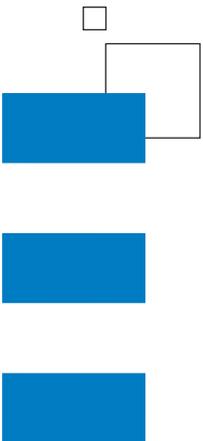
Creating an effective context also requires establishing a degree of clarity that some senior managers may prefer to avoid. Ambiguity defeats purposeful and coherent organizational behavior. Without clarity about purpose, boundaries, relationships and measurements, people throughout the organization who must make tough choices about trade-offs will have to make their own interpretations, thus increasing the chances that these choices will be inconsistent both with one another and with organizational purpose. Whether equivocation stems from leaders' own uncertainty about the purpose or from their fear of offending a constituency, ambiguity about purpose, boundaries and essential structure all but guarantees incoherence. As difficult as it may be to achieve, the creation of organizational context is an absolute requirement for coherent, flexible and, ultimately, viable performance.

Leaders' responsibilities do not end with creating context. They must go on to ensure that organizational behavior accords with it. This requires tracking the important commitments negotiated among accountable, empowered people. Defining organizational roles in terms of commitments made to deliver particular outcomes to particular internal or external customers puts appropriate emphasis on the interaction of system elements, not on their actions. It also emphasizes the system-defined outcomes required of these roles—that is, their contribution to organizational purpose, as opposed to the procedures required to produce that contribution. People in roles defined this way come to understand that they are not accountable for their actions but for the consequences of their actions.

Coordinating commitments, rather than supervising activities, is the proper concern of sense-and-respond leadership. This is a crucial distinction. Activities are the focus of make-and-sell management, whose function is to keep the organizational machine running smoothly by making sure that people perform specified tasks at or above specified levels of productivity and quality.

In a sense-and-respond organization, roles are not defined in terms of activities, because responding effectively to unanticipated customer requests requires the continual invention of new ways of doing things. Sense-and-respond leaders must manage the interlocking sets of commitments required to marshal a response consistent with the enterprise context. Deciding how those commitments are met—the processes used to produce the outcomes—falls to those making the commitments, within the limits established by the governing principles.





### **Managing by wire**

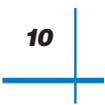
In the Information Age, more and more knowledge and more and more ways of creating economic value are being abstracted into symbols that can be combined, transformed and sent around the world at electronic speed. Our ability to manipulate this dematerialized reality drives both wealth creation and the discontinuous change that makes sense-and-respond organizations necessary. To be adaptive, however, organizations must meet an essential criterion for processing information from the environment: They must translate apparent noise into meaning faster than it arrives.<sup>2</sup> As both noise and potentially meaningful data arrive faster and faster, complex organizations in complex environments need help to sense and interpret events quickly.

Managing the consequences of using information technology requires more information technology. The abstraction and electronic manipulation that have increased the speed of change can be used to manage it. In the mid-1980s, farsighted managers at Westpac, the Australian bank, concluded that they could improve the speed of the bank's adaptation to change by first modularizing and then codifying core functions, policies and knowledge in an electronic system. Linking this system to current information about their environment, they were able to reduce their time to market with new products, meeting changed market conditions in weeks or months instead of months or years. Although successor executive teams did not use the technological initiative to support a complete sense-and-respond transformation at Westpac, the effort established the feasibility and benefits of running an organization by managing its electronic representation.

The term for managing a business by managing its information representation is *managing by wire*, an expression meant to draw an analogy to modern aviation's fly-by-wire systems.<sup>3</sup> When jet engine technology arrived, airplanes became so fast that unassisted human pilots could no longer sense, interpret and act on information quickly enough to fly them. So computer systems were developed to present pilots with concise displays of essential information and then to translate pilot responses into the myriad actions needed to execute the pilot's decisions. This technology mediated and accelerated the pilot's adaptive loop, making it possible to fly a plane traveling at several times the speed of sound. Managers needing to "fly" modern, fast-moving businesses will increasingly find similar systems both technically feasible and necessary.

### **Managing the sense-and-respond transformation**

Some executives have already begun to adopt the sense-and-respond model. Analysis of their experiences demonstrates just how fundamental a change it entails. These pioneers reconceived their organizations from top to bottom, developing new roles and structures and educating their organizations' members about new ways of thinking about their responsibilities. Not content with looking for better ways to continue doing what they have always done, they are striving to change their corporate DNA. Having recognized the imperatives of a new economic world, they strive to become the type of organization that can thrive there. They have discovered, as well, that changing from the make-and-sell to the sense-and-respond model requires transformation, not merely reformation.



Transforming a system involves changing both its purpose and its structure.<sup>4</sup> Leaders must anticipate the effects on the whole system of each change they make to any part of it. A system cannot be improved, much less transformed, by making isolated adjustments to individual capabilities. The transformation from make-and-sell, however, should not, and probably could not, happen all at once. Individual decision makers must nonetheless maintain a constant awareness of the larger context and take it into account when weighing options.

Organizations will find the journey to sense-and-respond challenging; most make-and-sell organizations will evolve into hybrids of make-and-sell and sense-and-respond, developing sense-and-respond capabilities only as they create value for their customers. General Motors, for example, has developed a strategic framework for moving systematically from a make-and-sell to a predominantly sense-and-respond enterprise. The competencies required to create and manage large, adaptive organizations are rare and will have to be developed. Many firms will nevertheless undertake the transformation because, in the long run, they have no alternative—their survival in our age of discontinuity depends on it.

An increasingly unpredictable marketplace is the premise of the sense-and-respond model. For large enterprises, this model promises systematic and successful adaptation without sacrificing the benefits of scale and scope. Between acceptance of the premise and realization of the promise lies a new way of thinking about strategy, structure and governance.

**For more information**

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