

Peripheral Vision: Sensing and Acting on Weak Signals Making Meaning out of Apparent Noise: The Need for a New Managerial Framework

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Doing business in the face of constant change requires a shift from a 'make-and-sell' to a 'sense-and-respond' framework. This in turn requires four new competencies which require intense attention to what would have been considered the periphery of the traditional make-and-sell company—the customers and environment. The paper concludes by saying it is important to invest in expanding an organisation's peripheral vision because it will make meaning out of apparent noise; it will extend the number and types of signals that can be sensed; it will drive the development of an ability to transform new signals into meaning; and it enables role-specific management.

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Introduction

What makes *Dilbert* funny? In the cartoon strip, Dilbert is savvy about the new realities of doing business, but his pointy-haired manager is trapped in the old mindset. Doing what the manager wants done makes no sense to Dilbert. And doing what makes sense to Dilbert (and to us), makes no sense to his troglodyte manager, who represents an exaggerated, but still recognisable, example of the way 'the business' thinks. We see humour in this because we are familiar with both models, and the irreconcilable differences between them is deliciously distilled by Scott Adams in his comic strips.

Notwithstanding the miles of *Dilbert* strips tacked to the walls in thousands of offices, this clash of frameworks is no laughing matter in business. Today, the ability of individuals to adapt rapidly to new and unanticipated events in a complex and dynamically changing environment is crucial. But realising business advantage from the ability of people to adapt can be frustrated if the institutional framework within which they work says best practice is to run the company as a machine.¹ The business environment has changed radically since Fredrick Taylor, Henry Ford, Alfred Sloan and other giants of the early 20th century formulated the concepts and principles that became institutionalised as the industrial age ‘make and sell’ managerial framework. For Frederick Taylor, in particular, businesses were not like machines, they *were* machines. The managerial challenge lay in devising ways to make these machines more and more efficient. The logic of his prescriptions for scientific management led to innovations such as the assembly line, time and motion study, business process design, and, most recently, Six Sigma execution of optimised processes. Taylor’s model leveraged the fact that marketplace change was usually gradual enough to make incremental organisational change an effective way to cope with it. Phrases such as ‘plan your work, work your plan’, ‘we control our destiny’, ‘optimisation’, ‘supervision’, ‘supply chains’, ‘value chains’, and ‘chains of command’ are examples of make-and-sell vocabulary that reveal how deeply the concepts of stability, efficiency and predictability are embedded in today’s corporate mindsets—even those that proclaim responsiveness, speed, agility, resilience, variability and adaptiveness to be the institutional qualities they seek.

It’s more than just language. Industrial age logic lurks in the accounting practices, measurement and reward systems, organisation structures, budgets, quotas, process designs and business case methodologies—i.e. the DNA—of almost every large corporation. It is ironic, even Dilbertian, that most executives who celebrate innovative, bureaucracy-busting behaviours apparently do not recognise their own responsibility for replacing the obsolete make-and-sell managerial framework with one that systematically fosters and exploits the adaptive behaviour they ask of their people.²

Organisations must rely on people skilled at translating apparent noise into meaning

Making meaning out of apparent noise: a core competence for adaptive organisations

Increasingly unpredictable and discontinuous change is baked into the logic of the information age. To survive in this environment, organisations must rely on people skilled at translating apparent (not real) noise into meaning faster than such apparent noise comes at them. Adaptive systems, be they people, flatworms, companies or computer viruses, are successful at making meaning out of apparent noise—signals from the periphery that do not make sense in one context, but do in another. How they do this can be explained by examining the atomic structure of our sense-making mechanism. It consists of three elements: an *object or event*; a *framework*; and an *association* between them.³ If any of these elements are lacking, sense-making is not possible. Therefore, when something unprecedented presents itself, the ability to make the associations by invoking a new and appropriate context becomes a survival trait. (Note that this is *not* ‘thinking outside the box’. It is thinking in a *different* box. People who have no box to think in are clinically insane.)

Many of us personally experienced the phenomenon of abrupt context change on the morning of September 11, 2001. When we heard about the first aircraft hitting one of the twin towers of the World Trade Center, we made sense of this by invoking the context of pilot error, or some kind of mechanical malfunction—an *accident*. But when the second aircraft crashed

into the second tower, we experienced confusion—it was very difficult to associate two aircraft crashes in 20 minutes with an *accident* framework. Most of us invoked a rapid sequence of context changes (*plot, conspiracy, terrorism*) to make sense out of what happened. Someone who happened to be an expert in terrorism might well have spontaneously elaborated the terrorism context to incorporate *Al Qaeda*, or even *Usama bin Laden*.

A shift in institutionalised managerial frameworks: from make-and-sell to sense-and-respond

Doing business in the face of constant unpredictable change requires a fundamental shift from a ‘make-and-sell’ to a ‘sense-and-respond’ institutional framework. The rest of this article is devoted to a description of the new framework, and the fundamental ways in which it differs from make-and-sell.

Make-and-sell companies are bus companies; sense-and-respond businesses are taxi companies. Bus companies schedule their operations in advance, in accordance with a pre-established plan to use an optimised route—one that will get the most people from where they are to where they want to go. Taxi companies dispatch their capabilities in response to what their current customers want. Bus drivers do not need customers to begin their work each day—they have a schedule. But taxi drivers cannot start work without a customer—because the customer is the only one who knows where to go. Bus drivers are evaluated and rewarded based on how well they execute the company’s schedule. Taxi drivers are evaluated by their customers—on the basis of how well they produce the result defined by the customer. Bus companies make and sell offers *to* customers; taxi companies sense and respond to requests *from* customers.

The shift to a sense-and-respond mindset means recasting strategy, structure and governance

In an information economy, where even customers are less and less able to predict (much less articulate) what they will want in the future, the basic transaction is that between a taxi driver and his potential customer: an exchange of information from the customer about value in return for a supplier response that provides that value. The customer-supplier relationship becomes co-productive and co-evolutionary. The strategic game becomes a *game with customers*. The view of strategy as a game against competition, rather than with customers, is another gene from Taylor’s DNA. It is from an era in history when survival depended on out-performing your competition in doing what you both could predict needs doing.

The shift to a sense-and-respond mindset means recasting strategy, structure and governance. Strategy becomes a design for action, rather than a plan of action (see [Exhibit 1](#)). Structure becomes a network of modular, collaborative capabilities, as opposed to vertical silos of functional authority linked by enterprise processes and matrix management. And governance is no longer command and control, but context and co-ordination. In this form of governance, leadership provides a common context about purpose, bounds and relationships. It provides the means for individuals to self-synchronise using increasingly improvisational, one-off behaviours within the common context.

Other fundamental differences between the Make and Sell and Sense and Respond managerial frameworks are illustrated in [Figure 1](#):

- **Scope:** The business scope changes from products aimed at markets to a repertoire of dynamically changing capabilities matched to current customer preferences and values.

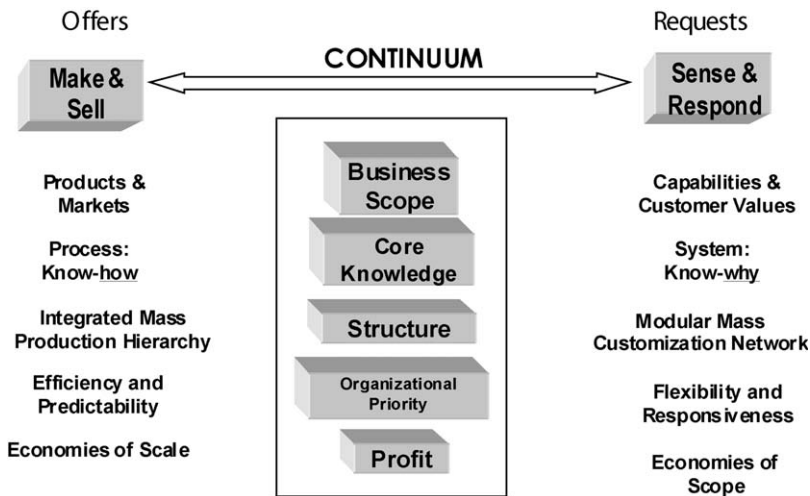


Figure 1. The make and sell and sense and respond frameworks

- **Core Knowledge:** The core knowledge moves from process know-how to system ‘know-why’. To take an example from the sports world, consider how St Louis Rams running back Marshall Faulk leverages systems knowledge to know how to respond to unexpected developments on the playing field. First of all, he memorises every play for every position in the Rams’ playbook—a prodigious feat. He does this because he wants to know the outcomes each player is accountable for—*not* how they achieve those outcomes (process knowledge). Seeing the pattern of outcomes reveals their relationships—how they interact to produce a team-level result—and tells him why each player does what he does. This is systems knowledge and it enables him to know the systems-level outcome that is implicit in what is currently happening on the field. For instance, if he saw a team mate was a half-step late in executing his part of play, Faulk improvises on the spot to a better solution. He doesn’t predict the systems-level outcome; he *knows* it, because that systems result is implicit in the current pattern of intermediate outcomes. Like hockey star Wayne Gretzky, who ‘skates to where the puck is going to be’, Faulk leverages his unique systems knowledge to know earlier than others the future consequences of what is happening.
- **Structure:** Enterprise structure is no longer a tightly integrated—ideally automated—value chain designed to produce efficiently what the company predicts customers will want in the future. Rather, it is rather a network of modular capabilities that can be rapidly and profitably reconfigured in response to what individual customers need now.
- **Organisational Priority:** The organising principle moves from efficiency and predictability to adaptability and responsiveness. This changes the meaning of operational excellence from ‘flawless execution’ of best practice to ‘timely creation and execution of sufficiently good *next* practices’.
- **Profit:** The source of profit shifts from economies of scale to economies of scope. Sufficient reuse of modular capabilities that can be rapidly reconfigured in response to a wide range of opportunities makes it possible to achieve both profitability and adaptability.

The make-and-sell versus sense-and-respond frameworks are based on fundamentally different premises. They represent different dominant logics and require new norms of thinking. The contrast between these approaches can be seen in Table 1, which summarises ‘unnatural acts’ that do not make sense or are taboo under the two different frameworks. With the exception of matrix management, the prescriptions listed in column 1 are good ideas for making a firm more adaptive. Books have been written and courses taught on many of them. But implementing them in the existing framework creates cognitive dissonance between what it makes sense to

Table 1. Unnatural acts (partial list)

| In a Make and Sell Organisation | In a Sense and Respond Organisation |
|--|---|
| <ul style="list-style-type: none"> ● Simple Rules ● Empowerment ● Real Options ● Improvisation ● Fast Prototype ● Teams ● Outsourcing ● Negotiation/Renegotiation ● Scenario Planning ● Dynamic Business Models ● Matrix Management | <ul style="list-style-type: none"> ● Strategic Plans of Action ● Hierarchies of Authority ● Rewarding Utilisation ● Commands ● Supervising ● Demand Forecasting ● Annual Budgets ● Vertical Integration ● “Line-of-Sight” Measurements ● Value <i>chains</i>, supply <i>chains</i> ● Matrix Management |

do, and what it makes *institutional* sense to do. As a result, it is very difficult to imbed these behaviours, and even more difficult to sustain them. Frederick Taylor would be horrified by the practices shown in the left column were he suddenly transported into an organisation that had adopted them. The last thing he would want to see are multifunction teams innovating a better way to do things. That was, for him, the job of managers (the knowers) not workers (the doers).

Implicit in the shift from a make-and-sell to a sense-and-respond framework are yet other changes in the way we think about business. For example, the idea of the ‘enterprise-as-corporate-entity’ goes away, replaced by the concept of the enterprise as a value-producing system of capabilities—as many as possible of which are rented, not owned, in order to accommodate increasingly unpredictable levels of demand. And the focus of organisational strategy shifts from activities to outcomes; from a plan *of* action to a design *for* action that specifies how organisational capabilities *interact* with one another (see Exhibit 1).

Four new core competencies

Giving up the premise of predictability means that sense-and-respond organisations require new core competencies:

- **Knowing earlier:** If the uncertain environment makes it impossible to predict better what will happen, organisations must invest in knowing earlier the meaning of what is happening now. This can be accomplished through more and better probes, superior analysis of existing data, superior pattern recognition, faster frame-switching, and the development of systems knowledge – knowing why. When customer needs and new capabilities are both changing unpredictably, premiums flow to those companies that can diagnose earlier and respond faster, just as a doctor provides significant value by telling you that your stomach ache is appendicitis, and that you need an appendectomy *now*. The doctor’s ability to interpret the signals that you emit during palpation, probing, blood tests and MRIs enables him or her to know earlier than you do what you need now, and to devise an expert prescription for action.
- **Managing by wire:** Knowing earlier is only useful if the organisation can act upon that knowledge appropriately, and in time. In aviation, ‘fly-by-wire’ systems enable pilots to fly airplanes that travel an order of magnitude faster than planes in which the pilot directly controls the plane’s hydraulics. Fly-by wire systems use technology to represent the plane to the pilot and the pilot to the plane. This information intermediation enables pilots to make

Exhibit 1.

What's the plan?

During Week One of the Iraqi conflict, the media made the war plan the focus of its attention. While the discussion between reporters, retired senior military officers and officials who had created the plan were often unedifying and inconclusive, they did serve to highlight one thing: different people mean entirely different things by the term 'plan'.

Senior journalists such as Michael Gordon of the *New York Times*, and distinguished retirees such as General Barry McCaffrey talked about the plan as it has been traditionally thought of: a course of action to achieved defined objectives. Accordingly, they were absorbed in comparisons between expected and actual events, and whether or not the military was surprised by the stiffness of Iraqi resistance or the apparent lack of enthusiasm on the part of some Iraqi civilians upon seeing the coalition troops arrive. The inability of an overtaxed supply line to keep pace with the opportunistic race of troops to Baghdad was cited as evidence of being 'off plan'.

Every senior military officer knows and believes in the adage, 'No plan survives first contact with the enemy.' Yet both Secretary Donald Rumsfeld and General Richard Myers were vigorous in their defence of this plan, consistently characterising it as innovative and brilliant. In one press conference, Rumsfeld went so far as to say that the coalition was 'exactly' on plan. At another, Myers told reporters that the plan had multiple branches, implying that everything that had happened so far fit tidily into one or another of these contingencies.

But General Tommy Franks, the author of the plan, made statements that suggested a different view of what a 'plan' was and a different approach to planning. First, he said that he expected surprises. And second, he talked about his confidence that the coalition would be able to adapt when such surprises occurred. This confidence was based on the fact that he felt prepared to deal with a very broad spectrum of possible eventualities—from 'catastrophic success' to stubborn resistance throughout the country. By saying that he expected surprises, Franks was acknowledging that the people who developed all the branches that Myers talked about were not clairvoyants. But if they weren't, how could he be so confident that surprises could be dealt with?

It is quite likely that he was not placing his confidence in a traditional plan or any of its branches. Rather he was relying on an adaptive design, and on the competence of his subordinate commanders to make good and mutually coherent local decisions within the framework of that design. A design for action is fundamentally different from a plan of action. Action plans, and their close relatives, procedures, are only as good as the ability of the planners to identify in advance what contingencies might arise. That's why they never survive first contact with the enemy, who ordinarily is not a willing contributor to the planning process.

Designs for action, on the other hand, are *system architectures* that specify capabilities and the interactions between them. There is no time dimension in such a design. There are no activities in such a design. There is only the specification of:

- The outcome that the organisation is missioned to produce (elimination of Iraq's weapons of mass destruction, displacement of Saddam's regime, preservation of the oil wells, etc.)
- The type of effects, or outcomes, that each design element (role) is accountable for producing (particular manoeuvres, fires, denial of access, target destruction, logistical sustainment, intelligence, for example),
- Who is accountable for producing and who for receiving each category of outcome,

- What are the constraint/restraint boundaries governing the deployment of the capabilities (in military lingo, the latter are typically called Rules of Engagement).

A design for action is a role and accountability design that defines who owes what to whom. In a stable environment, the roles can be dispatched in advance. This results in a schedule or a process design. Because things are sufficiently predictable, the premium is on efficient—even six sigma—execution of the schedule. The design for action is transformed into an plan of action by the people at the top of the organisation. This is presumably what the media and military analysts assumed they were critiquing. In this mindset, deviations from the plan are considered defects.

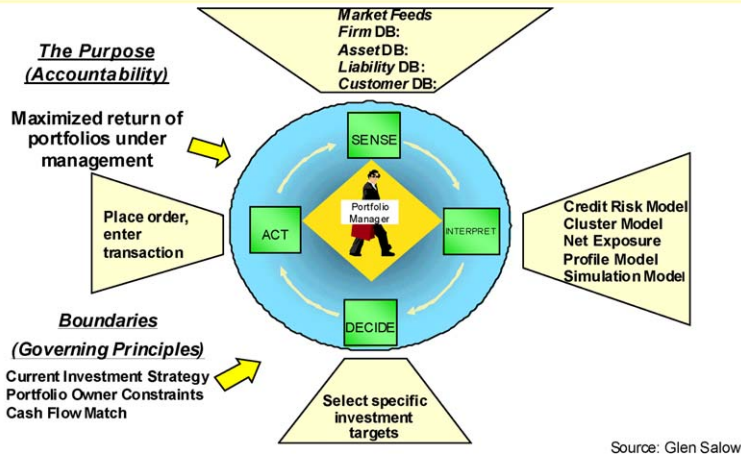
But when things are so unpredictable that you have to expect continuous surprise, you want to sequence your capabilities as late as possible. To the maximum extent possible, you want the local commanders to do it, because they know more about what they need in the moment. For this to result in coherent behaviour at the organisational level, these commanders must be in constant touch with one another, share information about what is happening, and operate with internally consistent rules of engagement. They can then exploit the increased tempo enabled by an ability to locally dispatch and synchronise special ops, tanks, Blackhawks, bombers, fighters and other combat elements. The Iraqi army had much slower sense-and-respond cycles, and were consequently back on their heels from the start of the war.

The question for business managers and strategic planners is: does the company face traditional enemies who fight in relatively predictable ways, in which case they can rely on a century of good theory and practice on how to plan, make and sell better? Or does it face what the military calls ‘asymmetric’ threats and opportunities in an unpredictable environment of rapid change? The nature of businesses in an information economy suggests that leaders need to move beyond planning contingency actions. To do so they must become adept at applying the principles of adaptive systems designs that leverage the combinatorial mathematics of modular systems. This exponentially increases the number of possible responses that can be configured to deal with what General Franks called ‘expected surprises’.

sense out of the current situation better and faster (know earlier), and translate decisions into action at electronic speeds. As a result, human beings who cannot fly planes at more than 400 miles per hour when in direct control of the hydraulics can fly jets at Mach 6 speeds using fly-by-wire systems.

The same idea can be applied to organisational decision-makers, enabling what Richard Nolan and I have described as ‘managing by wire’.⁴ For example, Aetna used a managing-by-wire system to reduce the cycle time for their financial investment portfolio operations. Cycle time is defined as the time required to make one iteration through the adaptive loop: Sense-Interpret-Decide-Act.⁵ Figure 2 illustrates Aetna’s design for a heads-up display to support the portfolio manager role. After making explicit the context within which all people in this role must operate (the outcome they are accountable for, the global constraints imposed by the leadership of the investment division, and the local constraints imposed by individual portfolio owners), Aetna provided each portfolio manager with a ‘heads-up display’ consisting of two monitors. One was a Bloomberg terminal, where real-time business news was continually shown. The other monitor showed graphic displays of the current status of the models customised for portfolio managers to help them decide which securities to buy and sell. The result was a reduction in average cycle time from one week to less than 24 hours, an improvement of 8 basis points in the performance of the investment division, and testimony from the portfolio

Managing by Wire at Aetna: Improvisation in Context



Source: Glen Salow

Figure 2. Managing by wire at Aetna

mangers that, because of the shortened cycle time, they felt truly accountable for their decisions for the first time.

- **Dispatching capabilities from the event back:** Operations in a sense-and-respond organisation are driven from a customer request (an event) back, rather than from a company's plan forward. This means that capabilities must be modular and recombinable. They should be linked, or chained, at the latest possible moment—when the specifics of the customer's present need is discerned. And this should be ideally done by the customer-facing role, rather than by an executive decision-maker high up in the chain of command. This has obvious and major implications for the qualifications and accountabilities of the customer-facing role. Negotiating deals on behalf of the company, making bid/no-bid decisions, delivering on the results committed to the customer while meeting profit and revenue commitments to the company, and distributing budget to engage the capabilities needed to deliver the response negotiated with the customer—these are general management responsibilities, not sales responsibilities. Authentic customer-back business designs therefore have major implications for the selection, training and qualifications required of people on the front line.
- **Designing a business as a system:** Adaptive organisations need to adopt, whole cloth, system design principles as managerial tenets. System design is akin to, but not the same as, using systems thinking. Systems thinking can help diagnose and improve operational problems, the benefits of which are directly proportional to how well a business actually operates as a system. Systems designs, by their very nature, produce synergy and align every element of the system around a common purpose. *Designing* a business as a system means specifying the interactions among, rather than actions of, organisational capabilities. It means designing a business from the purpose down, never from the capabilities up.

Violation of this principle goes a long way to explain why three out four mergers and acquisitions fail. 'Post-merger integration projects' that attempt to create a new organisational design by figuring out how to relate the pieces of a newly acquired firm with an existing one are a bottoms-up approach, and will almost always fail. Post-merger integration is right up there with 'post-meal menu planning' as a flawed managerial concept.⁶

Because of its focus on knowing earlier the meaning of what is happening in the present, a sense-and-respond organisation must spend a lot of time and energy exploring signals on the periphery of its current field of vision. It is a fuzzy area, beyond the signals that we know and

pay attention to. When we place probes in this fuzziness, we pick up some signals that appear to be random. Some of them *are* random, and therefore beyond the reach of meaning. But some of them are only apparently random. These are the events and objects that are missing a framework, or an association with a framework. The ability to connect these dots with a robust framework is a condition of survival.

Investing in expanding an organisation's peripheral vision

In a traditional make-and-sell organisation investments in exploration of the periphery can safely be added to the list of unnatural acts. Looking beyond the boundaries of the present framework unavoidably means picking up signals that are apparent noise in terms of the present framework. But noise, apparent or real, is a distraction. And distractions are mortal enemies of efficient execution of the plans 'we've all agreed to'. This is why Taylor did not want employees to think beyond the confines of the procedures and handoffs they were, at great expense, trained to execute in an optimal fashion.

But in the Information Age, peripheral vision investments become especially important because they can:

- extend the number and types of signals we are able to sense.
- nurture an ability to transform new signals into meaning, rather than dismiss them as meaningless noise. Individuals must become adept at changing their local context appropriately, and organisational leaders must become skilled at continually adapting the global enterprise context (what are we here to achieve, what are the boundaries on acceptable behaviour, and how do we relate to one another). They cannot do this if they are not exposed to the new signals that first emerge on the periphery.
- enable role-specific managing-by-wire support, which makes possible order of magnitude decreases in sense-and-respond cycle time by key decision-makers.

By developing the institutional core competences of knowing earlier, managing by wire, dispatching capabilities from the event back, and designing the business as a system, an organisation can systematically become better at understanding and acting upon changes at the periphery. That translates into increased adaptability, which, in the New Economy, translates into success.

References

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5. For a detailed discussion of the adaptive loop, see Chapter 5 in Haeckel, *Adaptive Enterprise: Creating and Leading Sense-and-Respond Organizations*, Harvard Business School Press, Cambridge, MA, USA (1999).
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Biographies

Stephan H. Haeckel is President of Adaptive Business Designs, an executive education and coaching consultancy in Pound Ridge, NY. He recently retired as Director of Strategic Studies at IBM's Advanced Business Institute, where he coined the term sense and respond as a business concept, and developed it into a new managerial framework. His book, *Adaptive Enterprise: Creating and Leading Sense-and-Respond Organizations* (Harvard Business School Press, 1999), describes in detail the Sense & Respond prescription for systematic adaptiveness. Email: haeckel@optonline.net