Scenarios: shooting the rapids

Pierre Wack

One of the most constant variables of today's management practices is the notion of change, adaptation, and innovation. Executives willingly embrace change when solutions can be found for and applied to particular problems. Losing sales? Improve product quality. Taking too long to get your product to the distributor? Shake up inventory. Threatened by a takeover? Make your management and corporation more lean, mean, and responsive to the shareholders.

In a way, such change is easy because it doesn't challenge the assumptions of good managers. Faced with a problem, they simply apply yet another formulaic solution. In the end, such easy change won't work against the kind of economic upheaval that has occurred in the last 15 years. Some fundamental modifications have been made in the way we do business. Shouldn't the corporate response be equally fundamental?

In the last issue of HBR, the author described how he and a group of strategic planners at Royal Dutch/Shell began to put in place a most innovative way to prepare managers to think more clearly about the future—scenario analysis. What was required was not the application of a new formula for planning but rather a new way of thinking. To show how difficult the transformation, the author described how the company came up with the idea and developed it in the early 1970s. In this sequel, he carries the story forward to describe the medium-term scenarios constructed in 1975. At a time when management's attention suddenly became fixed on the next quarter as opposed to the next decade, effective medium-term analysis proved vital in translating scenario theory into practice. The author patiently walks the reader through the development of the 1975 scenarios and then discusses the implications of scenario analysis on the practice of management.

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I recently discussed scenario analysis with a well-known futurist. After I had listened to his presentation of a set of six scenarios, he asked me what I thought. "It was beautifully written, if complex," I replied. When pressed, I admitted that it was "impenetrable." I added, "The managers who hear it won't know what to do with it." To which the consultant responded, "That is not really my concern. I simply lay out the possibilities for them. It is up to the managers to know what they should do. I can't possibly tell them."

This small illustration points up the key problem with scenario planning: the interface of scenarios and decision makers is ignored or neglected. By interface, I mean the point at which the scenario really touches a chord in the manager's mind—the moment at which it has real meaning for him or her. The fact that those with the responsibility for preparing the scenario do not feel any responsibility for the interface is the main reason that—despite the logical appeal scenarios should have for managers disenchanted with forecasts—scenario planning has been scarcely developed.

Scenarios that merely quantify alternative outcomes of obvious uncertainties never inspire a management team's enthusiasm, even if all the alternatives are plausible. Most executives do not like to face such alternatives. They yearn for some kind of "definiteness" when dealing with the uncertainty that is the business environment, even if they have had their fingers burned for relying on past forecasts.

The same managers who can easily decide between different courses of action when they are in control often become unstuck when confronted with alternative futures they can't control and don't really understand. The reason is partly historical: many managers developed their skills in the 1950s and 1960s, an era characterized by an unusually high level of economic predictability. Being competent then meant...
knowing the right answer; it was considered incompetent or unprofessional to say, "Things could go this way—or that."

In truth, scenarios are often popular with middle managers who do not have to make awesome, final decisions. It is really top managers—who have ultimate responsibility for a company's long-term strategy—who find scenarios unhelpful. Most have risen to the top of large organizations based on their good judgment. They are proud of that judgment and trust it; their faith in it is one of their key motivations. The usual scenario analysis confronts them with raw uncertainties on which they cannot exercise their judgment. Because they cannot use what they consider to be their best quality, they often say, "Why bother with all that scenario stuff? We'll go on as before." Top management's desire for a framework in which to exercise good judgment is so strong that many executives continue to rely on forecasts, even though they know that forecasts often miss critical turning points in the business environment and even when they have been hurt by poor forecasts before.

What distinguishes Shell's decision scenarios from the first-generation analyses delineated in my earlier article is not primarily technical; it is a different philosophy, having to do with management perceptions and judgment. The technicalities of decision scenarios derive from that philosophy. Almost by definition, scanning the business environment and crystallizing the findings in a set of scenarios means dealing with a world outside the corporation: for example, the evolution of demand, supply, prices, technology, competition, business cycle changes, and so forth. But this is only a half-truth and dangerous because there is another half. Because the raw materials of scenarios are made from this stuff of "outer space," it is not realized that more is needed: scenarios must come alive in "inner space," the manager's microcosm where choices are played out and judgment exercised.

Scenarios deal with two worlds: the world of facts and the world of perceptions. They explore for facts but they aim at perceptions inside the heads of decision makers. Their purpose is to gather and transform information of strategic significance into fresh perceptions. This transformation process is not trivial—more often than not it does not happen. When it works, it is a creative experience that generates a heartfelt "Aha!" from your managers and leads to strategic insights beyond the mind's previous reach. I have found that getting to that management "Aha!" is the real challenge of scenario analysis. It does not simply leap at you when you've presented all the possible alternatives, no matter how eloquent your expression or how beautifully drawn your charts. It happens when your message reaches the microcosms of decision makers, obliges them to question their assumptions about how their business world works, and leads them to change and reorganize their inner models of reality.

### Setting out

Scenario analysis demands first that managers understand the forces driving their business systems rather than rely on forecasts or alternatives (that is, someone else's understanding and judgment crystallized in a figure that then becomes a substitute for thinking). Using scenarios is as different from relying on forecasts as judo is from boxing: you want to use outside forces to your competitive advantage and make them work for you so that two plus two equals five or even more. You will find little or no power by merely accepting expert information about an outcome like the future price of oil or the future level of demand; power comes with an understanding of the forces behind the outcome. Scenarios must help decision makers develop their own feel for the nature of the system, the forces at work within it, the uncertainties that underlie the alternative scenarios, and the concepts useful for interpreting key data.

Scenarios structure the future into predetermined and uncertain elements (see Exhibit 1). The foundation of decision scenarios lies in exploration and expansion of the predetermined elements: events already in the pipeline whose consequences have yet to unfold, interdependencies within the system (surprises often arise from interconnectedness), breaks in trends, or the "impossible." Decision scenarios rule out impossible developments; they deny much more than they affirm.

I will now take a risk and describe a ten-year-old scenario analysis. It is a risk because the scenario's subject is the business cycle, and no subject threatens to bore the reader in quite the same way as a business cycle that has passed. Even so, the discussion is important because:

1. We may be near the top of the business cycle, and a recession with serious implications could begin, given the fragility of the world economy. It troubles me that so few companies have analyzed the implications for them of economic developments outside the range of surprise-free possibility. Macroeconomists may discuss contingencies but managers do not.

2. The scenario analysis I presented in the first article was somewhat atypical. It dealt with an

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The exhibits in Parts I and II are reprinted with the kind permission of Shell International Petroleum Company. I would like to acknowledge the original contributions of my former Shell colleagues and the members of Group Planning. G. A. Wagner, A. Bénard, K. Swart, and J. C. Davidson get special thanks because they were instrumental in launching the concept. My conceptualization of scenario analysis has benefited greatly from discussion with my former Harvard Business School colleagues, in particular Bruce Scott and David Bell. This article would not have been written without Norman Duncan and Peggy Evans. It expresses one or two things I have learned; it does not necessarily represent Shell’s current planning views or practices.

economic disruption of a magnitude we do not often encounter. Moreover, we believed the disruption was a predetermined factor; uncertain were the reactions to it.

The following example deals with more typical cyclical fluctuations. We presented it in May 1975, when the world was nearly at the bottom of the worst recession since World War II.

Analyzing the predetermined elements

When the oil shock of 1973-1974 made the dreams—and nightmares—described in the scenarios discussed in my first article come true, managers at Shell (like managers everywhere) redirected their attention to the short term, focusing on economic growth, oil demand, inflation, interest rates, and their sensitive relationship with OPEC suppliers. In 1975, we addressed their concerns by developing medium-term scenarios for the rapids. The predetermined elements of these scenarios were:

**The first wave— inflation.** Like a large rock dropped in a lake, the 1973 oil price increase generated a series of waves, beginning with inflation, which was higher than simple cost-through-the-system arithmetic would indicate (on average, only 3% or 4%). Booming world economies were already out of balance prior to the oil shock and affected by high inflation. Furthermore, the enormous publicity surrounding the oil price increase (coming as it did with production cuts and selective embargoes) caused major economic actors—trade unions, entrepreneurs, and consumers—to overanticipate the actual inflationary impact. Such overreaction added fuel to the fire, accelerating the rate of inflation.

**The second wave— deflation.** From mid-1974, a contraction in demand to well below production capacity followed. The extra cash outflow to OPEC acted like an external excise tax on consumer demand of some $60 billion each year—or 2.5% of OECD economies. Government anti-inflation policies contributed toward pushing demand far below production potential. Economic dominoes fell one by one as:

- The automobile industry, always on the margin of discretionary spending and vulnerable to both the real increase in gasoline prices and the “oil link” in the consumer’s mind, suffered an immediate decline, with extensive multiplier effects through the balance of the economy.
- Building and construction, also a powerful engine of economic activity, fell some six months later as government anti-inflation policies caused a credit crunch.
- The world iron and steel industry remained an island of continuing high activity for nine months after the oil shock. It was propped up by a backlog of orders (from shipyards, for instance) plus some stock building. Large orders from the communist world contributed toward keeping it buoyant longer than other sectors. Eventually, however, the decline in the automobile and construction industries had a domino effect on the iron and steel industry.

Two other actions deepened the recession. First, companies drastically ran down inventories. The imposition of credit controls in the face of shrinking demand and the expectation of a fall in prices guaranteed a drastic drop in inventories. When inventories are reduced by eight days, it is equivalent to forgoing six months of 5% economic growth; inventories in many segments were reduced by more than eight days. Next, consumer spending, long the stable engine of OECD economies, took a nosedive. For the first time since recovery started in the early 1950s, consumers stopped buying, increased savings, and began to worry about what the future might hold. The resulting recession was the most severe since World War II (see Exhibit II).

**Electoral rendezvous.** The governments of Japan, Germany, and the United States would each face the electorate in 1976. If the truism applies that people vote their pocketbooks, then presiding over a recession is an invitation to defeat at the polls. The incentives for incumbent governments to go for growth were thus overwhelming.

**Relflation in the pipeline.** Not only were politicians anticipating the 1976 elections, but they were also keenly aware that much of the hardship borne in 1975 was unnecessary and self-inflicted—the
deflation was too harsh. With excess capacity so widespread, governments could safely reflate and expanding output could reduce unit prices and further curb inflation. Such reflation would largely be self-financing through taxation on increasing income, sales, and profits, and lowered costs for unemployment benefits.

Long-term unemployment was becoming evident as a social problem. Unemployment falls most heavily on the young. Few governments could afford to do nothing about the prospect of a third graduating class moving from the classroom to the welfare rolls.

All these predetermined elements combined to make it virtually certain that governments would attempt to reflate.

Reaching the rapids

We spent much time developing the predetermined elements and understanding the recent past. To recapitulate, managers will only accept scenarios when their common, predetermined elements enter and unfold in their minds. We call this process “rooting” because scenarios on their own—that is, as mere description of alternative courses of events—would be effective and alive in the minds of managers as long as a tree without roots. I have seen many scenarios suffer this fate.

That economies would reflate was largely predetermined. What was unknown in the spring of 1975 was the timing and nature of the recovery. To illuminate the forces driving the further development of the system and its critical uncertainties, we designed two scenarios of recovery:

The “Boom and Bust” scenario foresaw a vigorous recovery that contained the seeds of its own destruction.

The “Constrained Growth” scenario projected a kind of “muddling-through” recovery that would differ fundamentally from earlier business cycle recoveries.

We also considered the possibility that reflation would not happen; our “Depression Contingency” scenario seemed so improbable, however, that we did not think it relevant for planning. The three possibilities are arrayed in Exhibit I.
Boom & Bust: a series of surprises

Boom and Bust described an economic world more characteristic of the 1950s than the 1960s. Cycles of greater amplitude and shorter duration would develop. We believed that the longer the recovery was deferred, the more likely this scenario—as governments turned to panic measures to reflate their economies.

First surprise—rapid recovery. Rather than tepid, the recovery would be swift, strong, and forceful, as some economies like that of the United States would grow by 11% or 12% in 18 months. Such growth would be as if an economy the size of Britain's were to appear all at once on the world map. Such a rebound would not imply spectacular achievements; it would only reflect the depth of the 1973-1975 dent in the economy—a coiled-spring effect.

Second surprise—oil-intensive recovery. Reports of OPEC's death, we believed, were premature. Even though news of energy savings might persuade governments that Western conservation measures could negate OPEC's negotiating strength, such a boast could not stand up to analysis. Reduced oil consump-

Third surprise—booming U.S. oil imports. The upsurge in U.S. oil imports would easily put to rest talk about "Project Independence," President Gerald Ford's import-reduction targets, and alternative energy projects. Our estimates indicated that in such a scenario U.S. imports would rise by 2.5 million barrels per day in 1976 (more than Britain's total imports or Kuwait's current exports), with a further increase of 2 million barrels per day in 1977 (in aggregate, more than Britain's total energy consumption).

Because we believed that a normal recovery would be equivalent to the sudden creation of a new economic nation, we could now add that the new nation would be almost totally dependent on Middle East oil. Consumer countries would once again be trapped.

Fourth surprise—stagnant alternative energies. Countries would find that alternative energy
programs consisted largely of empty words and paper tigers. Most nuclear plants operated well below design capacity, and many had been deferred or canceled. Little had been done in the coal sector. The OECD nations were not meeting their target forecasts for coal production. The world had come far from the crash programs of the dark days of the oil embargo. Alternative energies could do little to relieve consumer countries’ continued dependence on Middle East oil.

The bust—a second recession. High inflation—approaching hyperinflation in many of the weaker OECD nations—threatened a sustained recovery. Rates that would exceed the highest levels of 1974-1975 by a further 5% would become politically and socially intolerable, signaling to governments that the boom was getting out of control. Their reaction would be to reapply deflationary measures, including credit restrictions, higher interest rates, oil import controls, and limits on oil consumption. Just as the recovery would be surprisingly rapid, so the downturn could be sharp. Inventories would play an important role: stock building, starting from the depths of the current recession, would promote growth in production during the upswing. But as liquidity disappeared in the face of strong deflationary measures, stocks would be run down rapidly, making the downturn that much sharper.

How probable was the Boom and Bust scenario? Because it held out dramatic implications for all sectors of the world economy and oil in particular, we found it hard to give equal attention to the other scenario. Even so, in 1975, we still considered it less probable than its alternative, Constrained Growth. While we made no forecasts about the start of a boom, we were willing to assume that the longer the recovery took to get under way, the more likely the Boom and Bust scenario would occur.

### Constrained Growth: a new economic world

Everything in the Boom and Bust scenario was normal; the “surprises” were typical of business cycles. The Constrained Growth scenario was built on a more genuine surprise: recovery would be slower and more halting than any upturn of the post-World War II era.

The internal logic of this scenario was that the high-growth trend of the past 25 years had come to an end—not only because of the oil shock and the eclipse of the Bretton Woods monetary order, but also because the very success of the postwar economies brought with it limitations on continued vigorous growth. Along with unprecedented economic growth had come unprecedented expectations for higher standards of living and more impressive social welfare programs. High expectations produced a new economic rigidity as governments were locked into a continual round of tax increases to pay for these social programs. Moreover, industrialized countries now were slower to change and adjust to surprises—whether an oil crisis or new competitors like Japan and the industrializing countries of Southeast Asia.

Constrained growth would characterize the first years of this new economic world in which all the engines of growth—consumption, international trade, government spending, and investment—would work with less power.

Investment was emphasized as a change that we called a lasting “technological recession.” From the end of World War II until the early 1970s, the best new technology in basic industries could, on its own merit, outcompete existing technology. A new steel plant, for example, was more economical than an existing one per ton of capacity; new cement and paper plants, new refineries and tankers, and new power generation plants were regularly more efficient than the previous technology. Beginning in the early 1970s, however, such technological progress could not beat rising costs. It was now cheaper to acquire existing capacity than it was to order new capacity.

For perhaps 10 to 15 years, the unit capital and operating costs of almost all new plants in basic industries would exceed the costs of existing equipment. That would obviously discourage new investment in industries that had been the engine of postwar economic growth and accentuate inflationary pressure. We analyzed the other engines of growth: government spending would result in budget deficits and more rigidity; consumer spending would be changed by the maturation in the life cycle of a large range of consumer durables; and international trade would be characterized by accumulating imbalances and frictions.

### Exhibit II Decline in industrial production measured from previous cyclical peak

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<tr>
<th></th>
<th>USA</th>
<th>Europe</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recession first quarter, 1975</td>
<td>-14%</td>
<td>-9%</td>
<td>-19%</td>
</tr>
<tr>
<td>Previous postwar recessions</td>
<td>-7%</td>
<td>-2%</td>
<td>-2%</td>
</tr>
</tbody>
</table>
The overall conclusion was that the prospects for economic growth would be well below past achievements. This confirmed one of our long-term scenarios introduced in 1974: we would enter—by means of this constrained growth period—a completely new "world of internal contradictions": a world of low economic growth that would stand in stark contrast to the booming economies of the past 25 years.

Reaching shore

Let me give one final example of how global scenarios are used to bring focus to particular issues or projects. Scenarios are like cherry trees: their fruit grows neither on the trunk nor on the large boughs but rather on the small branches. The tree needs the trunk and boughs to grow the small branches.

The global scenarios I have described correspond to the tree's trunk; the country scenarios developed by the national Shell operating companies can be likened to boughs. They account for the predetermined and uncertain elements peculiar to their countries. The fruits are picked from the small branches. These are the scenarios that focus on a particular strategic issue, market, or investment.

One such set of focused scenarios has to do with the demand for OPEC oil—as opposed to oil received from other sources. Because OPEC oil is the balancing factor in the world energy system, its fluctuations reflect cyclical economic fluctuations—but amplified several times. A decline in economic activity translates into a larger decline in world oil consumption, which then translates into a much larger decline in OPEC oil demand. The reasons are: first, energy-intensive industries (like cement and steel) are more than proportionately affected in a recession; second, alternative energy sources are usually cheaper than oil; and third, OPEC oil, unlike domestic oil, has to be paid in foreign exchange.

In a recovery, a small rise in world energy demand would translate into larger rises in oil demand and even larger rises in OPEC oil demand. In the
Boom and Bust scenario, for example, a 13% increase in world energy demand in the first two years of a recovery would translate into a 23% increase in world oil demand and a 34% increase in OPEC oil demand. How would this demand match available supply? OPEC’s oil production fluctuates in a narrow band between two danger zones [see Exhibit IV]. Technical production capabilities and political willingness to produce determine the upper band, which is dangerous for oil-consuming countries, the threshold of “OPEC dissatisfaction” is shown in the lower band, which is dangerous for oil-producing countries because the solidarity and discipline of OPEC come under severe stress.

As an illustration, we made two simulations [shown in Exhibit IV]. The demand changes implicit in a normal boom starting in late 1975 would become manifest in the winter of 1976-1977, when supply would be tight and prices under severe pressure. A boom starting in late 1976 would be less dangerous.

Looking back at the trip

In the recovery of 1976-1978, economies developed mainly along the lines foreseen in the Constrained Growth scenario. We were indeed introduced to the world of internal contradictions. What had been the floor for long-term economic growth expectations before 1973 now became the ceiling. Many Shell managers recognized they were entering an era of slower growth and hedged their business plans accordingly. When the 1980s demanded leanness and restructuring, Shell was ready because it had begun the regimen early. That Shell saw this new world earlier than most could be seen by comparing the various energy forecasts made at the time. Shell consistently projected one of the lowest energy growth paths for the 1980s.

Scenarios serve two main purposes. The first is protective: anticipating and understanding risk. The second is entrepreneurial: discovering strategic options of which you were previously unaware. This latter purpose is in the long run more important. But while the more dramatic and [for Shell] dangerous of the two scenarios—Boom and Bust—did not occur, the exercise proved useful enough to our managers that medium-term scenarios were prepared every year thereafter while in the rapids. As C.W. MacMahon of the Bank of England has succinctly observed: “No time is as usefully wasted as that spent guarding against disasters that do not in the event occur.”

Reflections in twilight

I have found that scenarios can effectively organize a variety of seemingly unrelated economic, technological, competitive, political, and societal information and translate it into a framework for judgment—in a way that no model could do.

Decision scenarios acknowledge uncertainty and aim at structuring and understanding it—but not by merely crisscrossing variables and producing dozens or hundreds of outcomes. Instead, they create a few alternative and internally consistent pathways into the future. They are not a group of quasi-forecasts, one of which may be right. Decision scenarios describe different worlds, not just different outcomes in the same world. Never more than four [or it becomes unmanageable for most decision makers], the ideal number is one plus two; that is, first the surprise-free view [showing explicitly why and where it is fragile] and then two other worlds or different ways of seeing the world that focus on the critical uncertainties.

The point, to repeat, is not so much to have one scenario that “gets it right” as to have a set of scenarios that illuminates the major forces driving the system, their interrelationships, and the critical uncertainties. The users can then sharpen their focus on key environmental questions, aided by new concepts and a richer language system through which they exchange ideas and data.

A design that includes three scenarios describing alternative outcomes along a single dimension is dangerous because many managers cannot resist the temptation to identify the middle scenario as a baseline. A scheme based on two scenarios raises a similar risk if one is easily seen as optimistic and the other pessimistic. Managers then intuitively believe that reality must be somewhere in between. They “split the difference” to arrive at an answer not very different from a single-line forecast.

Experience shows that decision scenarios focus on critical uncertainties that are often very different from those that seemed obvious to managers at the beginning of the process. Despite this focus on uncertainty, decision scenarios do not paralyze managers. Rather, the deeper understanding of the risks that is gained often makes the decision maker capable of confronting apparently greater risk.

You can test the value of scenarios by asking two questions:

1. What do they leave out? In five to ten years, managers must not be able to say that the scenarios did not warn them of important events that subsequently happened.
2. Do they lead to action? If scenarios do not push managers to do something other than that indicated by past experience, they are nothing more than interesting speculation.

It is impossible to develop a set of decision scenarios without knowledge of managers' deepest concerns—something we did not fully appreciate when we developed our scenarios in the 1970s. We were lucky, however; our managers' concerns turned out to be precisely what we were studying. Later, we developed interview techniques to find out what was on their minds and to illuminate the existing decision framework. Today, the interview is one of the first steps taken when Shell starts a scenario exercise.

The decision scenarios I have described were global, or macrosenarios. To analyze particular aspects of a business, you develop focused scenarios that are custom tailored around a certain strategic issue, market, or investment. But you cannot start with a narrow focus because you will likely miss key things (or dimensions), or else you may cast the scenarios in the wrong way. You must wide-angle first to capture the big picture and then zoom in on the details.

We have found that scenarios are most effective when combined with:

**Strategic vision.** You should have a clear, structured view of what you want your company to be, which precedes your view of what you want your company to do (investing, divesting, penetrating new markets, and so forth).

**Option planning.** In most planning approaches, strategies are put forward on a single line and options—if there are any—are merely straw men. This is even more dangerous than single-line forecasting. Option planning, in which all options are put forward on a neutral mode, is practiced at both the business unit and corporate levels.

The purpose of a combined approach is option generation (see Exhibit V). If the scenario process does not bring out strategic options previously unconsidered by managers, then it has been sterile.

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**The gentle art of reperceiving**

Companies differ greatly in their effectiveness and speed in transforming the potential of scientific research into new products and processes. In times of rapid change, their effectiveness and speed in identifying and transforming information of strategic significance into strategic initiatives differ just as much.

Today, however, such a capacity is critical. Unless companies are careful, novel information
Seeing “rabbits in the hat”

As any adult knows, a magician cannot produce a rabbit unless it is already in (or very near) his hat. In the same way, surprises in the business environment almost never emerge without warning. To understand the warnings, managers must be able to look at available evidence in alternative ways. Otherwise, they can be badly misled by apparently valid facts if that is all they see, or they do not interpret them in different ways.

After the second oil shock, a “scenario for the rapids” covering the medium term 1980-1985 introduced a notion at odds with prevailing wisdom. Called a “high savings case,” it alerted management to “the possibility that consumers themselves would produce a surprise in the form of a much more rapid decrease in energy and oil intensity than that assumed for the reference case.” This would mean a further drop of 6 million barrels per day in the demand for OPEC oil.

At the time, there was little hard evidence to support the case. There is always a lag in the impact on demand of a price rise. Furthermore, there was great uncertainty about the oil market and anxiety about further supplies. The outbreak of the Iran-Iraq war increased anxiety about supplies from the Middle East. Both oil consumers and oil companies tried to increase their stocks of oil; customers’ orders were strong; and industry forecasts as well as the “feel of the market” all pointed toward sustained demand. The mood of the industry leaned toward expansion: 1980-1981 saw an enormous increase in drilling activity and feverish competition to secure term contracts for the supply of crude.

The problems of the oil industry were obviously on the supply side, not on the demand side.

In March 1981, the new 1981-1985 scenarios for the rapids stated that “last year’s conservation surprise can no longer be regarded merely as a contingency.” We also introduced a new scenario, “Hard Times,” that foresaw an economic recession deeper than most observers expected, an oil conservation surprise (drawn from the remarkable analysis by Aart Beijdorff), and societal change that would significantly affect both economic behavior and oil demand.

Under the Hard Times scenario, the combined effect of these three elements could lead to a totally different—and much lower—level of oil demand (see Figure A) than from the first oil shock—even though

![Figure A](OECD oil consumption)

<table>
<thead>
<tr>
<th>Year</th>
<th>Surprise-free reference case</th>
<th>Hard Times scenario</th>
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<tbody>
<tr>
<td>1960</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>65</td>
<td>30</td>
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<tr>
<td>85</td>
<td>10</td>
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AII = Average annual increase
AAD = Average annual decrease

outside the span of managerial expectations may not penetrate the core of decision makers’ minds, where possible futures are rehearsed and judgment exercised.

Historical examples abound. After concluding the nonaggression pact with Hitler in 1939, Stalin was so convinced the Germans would not attack as early as 1941—and certainly not without an ultimatum—that he ignored 84 warnings to the contrary. According to Barton Whaley, the warnings about Operation Barbarossa included communications from Richard Sorge, a Soviet spy in the German embassy in Tokyo, and Winston Churchill; the withdrawal of German merchant shipping from Soviet ports; and evacuation of German dependents from Moscow.

Or consider the case of Pearl Harbor. “Noise,” the massive volume of signals, impeded understanding of what was to come. As Roberta Wohlstetter points out, “To discriminate significant sounds
the immediate impact on GNP, balance of payment of OECD, and so on was surprisingly similar.

We called the likelihood of there being a real conservation surprise a "rabbit in the hat." Moreover, we were increasingly convinced that at least the two ears of our particular "rabbit" were already visible. First, less than one-sixth of the 1973-1974 crude oil price increase had been passed on to final consumers because of the cushioning effect of refining and transport costs and of various taxes in the selling price of the total products barrel. This time, however, more than half of the crude price rise would be felt by final consumers, a change that suggested consumers' reactions would be nonlinear.

Second, a radical change in consumers' perceptions seemed likely to reinforce this growing price leverage. Few people had believed in the reality of an oil crisis after 1973-1974; now the popular consensus seemed to be that the upward price trend was irreversible. This change in attitude, combined with the normal effect of a large price increase, could reawaken previously dormant price elasticity from the first oil shock.

Finally, we believed that the oil industry and OPEC were being fooled by the demand statistics, which reflected not real demand or actual consumption but deliveries only. Stock building at the consumer level as well as at the oil company level was abnormally high (see Figure B).

Figure B
Free world stocks

<table>
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<tr>
<th>Millions of barrels</th>
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<tbody>
<tr>
<td>6000</td>
</tr>
<tr>
<td>5500</td>
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<tr>
<td>5000</td>
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<td>4500</td>
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<td>4000</td>
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<tr>
<td>3500</td>
</tr>
<tr>
<td>3000</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Overstock
Working stock
Potential anxiety zone
Minimum stock?

- 96 days
- 115 days
- 122 days
- 91 days

1979 80 81 82 83

It is now clear that much of the oil industry in 1980-1981 overestimated future demand. In such a context, a company can make a lot of money selling weeks of unnecessary stocks before prices erode. It may be just a coincidence, but Shell companies' reduction in oil stocks through 1981 was much greater and earlier than that for the commercial stocks of the industry as a whole, even though Shell stocks at the beginning of the year (in terms of days' supply of current demand) were already well below the average.

The Hard Times scenario used a new hypothesis to analyze demand behavior and thereby alerted decision makers to the possibility of a major discontinuity in future oil demand. We saw more than the conventional consensus view of the industry mainly because we had been looking for alternative ways of seeing our world. A new strategic option emerged that encouraged us to go against the mainstream of the oil industry.

against this background of noise, one has to be listening for something or for one of several things.... One needs not only an ear but a variety of hypotheses that guide observation" (emphasis added). Indeed, the Japa-

nese commander of the Pearl Harbor attack, Mitsuo Fuchida, surprised at having achieved surprise, asked, "Had these Americans never heard of Port Arthur?" (the event preceding the Russo-Japanese War of 1904—and famous in Japan—when the Japanese navy destroyed the Russian Pacific fleet at anchor in Port Arthur in a surprise attack).

Similar business cases are not as well documented. I have observed some: the French steel
industry’s handling of the “FOS project” near Marseille, the tanker market before and after the first oil shock; petrochemical investments in Europe in the 1970s; and a large U.S. automobile manufacturer’s misinterpretation and dismissal of Japanese competition during a good part of the 1970s.

In each case, a number of executives—not just one individual—made decisions. Their inappropriate behavior extended over several months or even years—it was not just a one-time error. Problems resulted from a crisis of perception rather than from poor strategic reasoning. These decision makers’ strategies made sense and indeed were sometimes brilliant—within the context of their limited worldview.

In times of rapid change, a crisis of perception (that is, the inability to see an emerging novel reality by being locked inside obsolete assumptions) often causes strategic failure, particularly in large, well-run companies. Opportunities missed because managers did not recognize them in time are clearly more important than failures, which are visible to all. As Peter Drucker said, “The greatest danger in times of turbulence is not the turbulence, it is to act with yesterday’s logic.”

Central to decision scenarios—indeed the basis for their success or failure—is the microcosm of the decision makers: their inner model of reality, their set of assumptions that structure their understanding of the unfolding business environment and the factors critical to success. A manager’s inner model never mirrors reality; it is always a construct. It deals with complexity by focusing on what really matters. It is a superior simplification of reality—the more so, the wider a manager’s span of responsibility is.

During stable times, the mental model of a successful decision maker and unfolding reality match. Some adjustment and fine tuning will do. Decision scenarios have little or no leverage.

In times of rapid change and increased complexity, however, the manager’s mental model becomes a dangerously mixed bag: rich detail and understanding can coexist with dubious assumptions, selective inattention to alternative ways of interpreting evidence, and illusory projections. In these times, the scenario approach has leverage and can make a difference.

In today’s world, a management microcosm shaped by the past and sustained by the usual types of forecasts is inherently suspect and inadequate. Yet it is extremely difficult for managers to break out of their worldview while operating within it. When they are committed to a certain way of framing an issue, it is difficult for them to see solutions that lie outside this framework.

By presenting other ways of seeing the world, decision scenarios allow managers to break out of a one-eyed view. Scenarios give managers something very precious: the ability to reperceive reality. In a turbulent business environment, there is more to see than managers normally perceive. Highly relevant information goes unnoticed because, being locked into one way of looking, managers fail to see its significance [see the insert, “Seeing ‘Rabbits in the Hat’”].

It has been my repeated experience that the perceptions that emerge when the disciplined approach of scenario analysis is practiced are richer and often critically different from the previous implicit view. The scenario process of converting information into fresh perceptions has something of a “breeder effect”: it generates energy, much more energy than has been consumed in time and effort during the process.

A mere high or low around a baseline can never achieve a conceptual reframing. The reperception of reality and the discovery of strategic openings that follow the breaking of the manager’s assumptions (many of which are so taken for granted that the manager no longer is aware of them) are, after all, the essence of entrepreneurship. Scenario planning aims to rediscover the original entrepreneurial power of foresight in contexts of change, complexity, and uncertainty. It is precisely in these contexts—not in stable times—that the real opportunities lie to gain competitive advantage through strategy.

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