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[STRATEGY]

# How Scenario Planning Influences Strategic Decisions

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BY SHARDUL PHADNIS, CHRIS CAPLICE, AND YOSSI SHEFFI



The use of scenario planning once saved a credit union that had had Enron Corp. as its sole corporate sponsor. In their 2009 *MIT Sloan Management Review* article, “How to Make Sense of Weak Signals,” Paul J.H. Schoemaker and George S. Day described how, after Enron’s sudden collapse into Chapter 11 bankruptcy and scandal in 2001, the credit union survived, rather unexpectedly, because its management had taken previous actions to reduce its dependence on Enron. Management took these actions after considering scenarios in which the credit union could not depend on Enron for its growth.

Another example of a strategic decision influenced by the use of scenario planning is

UPS’ acquisition of Mail Boxes Etc. in 2001. This acquisition gave UPS more than 3,500 retail store locations in the U.S. to complement its network of large hubs used as mail-sorting facilities. A scenario called “Brave New World” — one of four scenarios UPS senior managers considered in formulating the company’s strategy — was a huge influence on the acquisition decision. The “Brave New World” scenario described a deregulated, globalized marketplace — markedly different from the world UPS was operating in in 2001. It was this scenario that convinced management to invest in retail locations.

Despite such anecdotal examples illustrating the power of scenario planning,

empirical evidence of the effect of scenario planning on executive judgment is almost nonexistent. That fact is surprising, considering not only that executives use this method to make important decisions, but also that the method requires extensive resources. What’s more, the few experimental studies of scenario planning that have been conducted reach conflicting conclusions.

To examine whether scenario planning produces measurable benefits, we conducted several workshops, examining whether — and how — the practice of scenario planning would influence various experts making long-term investment decisions.

## Scenario-Planning Workshops

As part of a U.S. infrastructure initiative called Future Freight Flows, which was sponsored by the National Cooperative Highway Research Program, we designed and ran several workshops for leaders from private-sector companies and public-sector transportation-planning agencies in the United States (for example, state Departments of Transportation and regional planning commissions). Long-range planning of transportation infrastructure is an ideal context in which to apply scenario planning. That’s because the planning and implementation can take several years — and most elements of transportation infrastructure have life spans of decades. The four scenarios we used were not mere demonstrations; the participating companies and agencies

planned to use the results to inform long-range planning.

We began by conducting a pretest. We asked each participant, two to six days before the workshop — and before he or she had seen the scenarios — to assess whether an investment should be made in each of the selected elements of the region's freight-transportation infrastructure, considering needs over the next 30 years. We asked for two responses: (1) whether the participant would recommend investing in that element; (2) what the participant's confidence in his or her own recommendation was.

We then asked participants the same questions after they had evaluated the elements first using one scenario and, later, multiple scenarios. These questions were our posttest. The posttest was conducted either during the workshop itself (for the single-scenario evaluation) or within one week after the workshop (for the multi-scenario evaluation). Any changes in a participant's judgment — from the pretest to the posttest — we attributed to the use of the single and/or multiple scenarios.

In every workshop, between 10 and 15 experts evaluated the chosen infrastructure elements in each scenario. We assigned the experts to the scenarios by using stratified random sampling to ensure a roughly equal representation of different stakeholder groups (for instance, government planners and shippers). We asked the participants to read a brochure describing the assigned scenario before the workshop. During the workshop, they watched a video of a fictional newscast describing events in the assigned scenario, discussed the scenario's implications for the region's freight environment, and evaluated the usefulness of each chosen infrastructure element for the scenario.

The participants recommended investing in particular elements of the transportation infrastructure by allotting

100 points according to the perceived relative usefulness in the scenario. If the participants did not recommend investing in a particular element of the region's freight-transportation infrastructure, they could give the element a veto vote. We used the votes as estimates of the usefulness of each element for the particular scenario.

### Implications for Executives and Long-Range Planners

Based on our findings, we offer three lessons for the use of scenario planning by executives and planners making strategic and long-range investment decisions.

**1. The use of multiple scenarios is not necessarily an antidote for overconfidence.** One should not assume that simply

If you are overconfident about your own judgment, you won't necessarily become humbled or less confident after your exposure to one or many scenarios.

using multiple scenarios to evaluate a long-range decision will help alleviate the negative effects of decision makers' overconfidence in their own judgment. Scenario users in our studies were almost equally likely to become more or less confident in their judgment after evaluating multiple scenarios. This does not mean that scenarios have no role to play in influencing long-range decisions. Executive judgment about long-range investment decisions is still likely to change after the decision is evaluated using a scenario. But our study findings showed that if you are overconfident about your own judgment, you won't necessarily become humbled or less confident after your exposure to one or many scenarios.

**2. Scenarios influence judgment — and their content matters.** More than half the judgments in our studies changed after single-scenario evaluations. Scenario users became more favorable of investing in an element — either by increasing confidence in their original recommendation to invest, decreasing confidence in their original recommendation to not invest, or changing their recommendation to favor the investment — when they found the element useful in a scenario. We found the opposite effects took place when scenario users found the element wasteful in a scenario. Since the scenario-influenced changes in executive judgment depend on the suitability of an investment to the world described in the scenario, it is important to ensure that the scenarios used

are relevant to the strategic decision under consideration. By extension, scenarios not specifically developed to guide a specific strategic decision may not be suitable for the task at hand.

**3. The use of multiple scenarios can nudge executives towards more flexible strategies.** Executives often choose strategies optimized for a particular environment. While such strategies may perform well in the environment envisioned at the time of their implementation, they may not be easily adaptable to new opportunities or in response to unexpected threats. Likewise, the likelihood of organizational assets being subject to such opportunities and threats is high when the assets have long lives — or

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when the environment evolves rapidly. Under such circumstances, evaluating strategic decisions using multiple scenarios can help executives appreciate the importance of choosing more flexible assets or approaches — even if doing so is not the most optimal choice for present-day conditions.

**Influencing Strategic Decisions**

Although workshop participants, in the aggregate, did not express less confidence in their judgments during their posttests, a majority of the participants did change their judgments after using the scenarios. The judgment changes were one of three types: (1) switching the recommendation for an investment in an infrastructure element from yes to no or vice versa; (2) changing the level of confidence

**RELATED RESEARCH**

► S. Phadnis, C. Caplice, Y. Sheffi, and M. Singh, "Effect of Scenario Planning on Field Experts' Judgment of Long-range Investment Decisions," *Strategic Management Journal* 36, no. 9 (September 2015): 1401-1411.

workshop. Thus, the level of confidence after using multiple scenarios was almost identical to that before the workshop.

But what's noteworthy here is that the participants changed their confidence in 161 of the 343 cases. In 51 of those 161 instances, participants lowered their confidence in judgment from the highest level after a multiple-scenario evaluation. For example, five experts had recommended investing in cargo airports in the western part of the state of Washington with the highest level of confidence before the

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they expressed in their recommendation (though seldom did they become less confident if they were confident to begin with); and (3) proposing a different approach for investing in a particular category of infrastructure elements.

For example, at a Future Freight Flows workshop at the Washington State Department of Transportation, participants evaluated an investment in a freight infrastructure element both before and immediately after the workshop. We ended up with 343 before-and-after pairs of assessments. Of those 343 pairs of assessments, the participants expressed the highest level of confidence in 158 assessments before the workshop and 157 after the

workshop. But after the workshop, they recommended either not making that investment or recommended the investment with a lower level of confidence.

Simultaneously, we observed 50 instances of an increase in confidence to the highest level after multiple-scenario evaluation. One example of this was the decision to invest in the strategic waterways along the Columbia and Snake rivers. Six of the experts who had recommended either not investing or who had recommended an investment with low confidence changed their recommendation to make the investment with the highest level of confidence after multiple scenarios. In short, the multiple-scenario evaluations

were just as likely to increase or decrease participants' confidence in a particular investment decision.

**The Importance of Flexibility**

We also examined if participants would choose a different approach to implement the chosen strategies after the scenario-based evaluation. In the Future Freight Flows workshop at the U.S. Department of Transportation, we asked participants to select one of four approaches for investing in various types of freight infrastructure segments, such as highway corridors, border crossings, etc. The four approaches specified varying levels of flexibility for funding infrastructure improvements projects.

After being presented with multiple scenarios, workshop participants subsequently expressed significantly higher preference for a more flexible option — which suggested allocating funds to specific regions but not to specific projects. Likewise, there was a commensurate drop in their preference for the least flexible option — which suggested immediate funding and implementation of specific projects — after the evaluation of multiple scenarios. In other words, considering multiple scenarios appeared to have spurred a greater appreciation of the benefits provided by flexible implementation strategies that keep more options open when faced with high uncertainty about the future environment.

**The Challenges of Scenario Planning**

Scenario development is not an easy undertaking. Creation of the scenarios used in the Future Freight Flows project required extensive research. The research began with a symposium in which thought leaders presented the potential future developments in their domains (technology, economics, demographics, etc.) to a few dozen public- and private-sector managers invited to the

symposium. We then asked the managers to note their thoughts about the implications of those future developments for the U.S. transportation infrastructure.

A subsequent brainstorming exercise among them distilled the findings into the driving forces shaping the U.S. transportation infrastructure over the next 30 years. We consolidated this information into 12 snapshot scenarios and presented them once more to the managers for feedback. Based on their feedback, we created a survey, which we administered to public and private sector stakeholders whose work pertains to the U.S. freight infrastructure (such as governmental transportation planners, shippers, carriers, and third-party logistics providers). We then analyzed the results of the survey to identify the key uncertainties and driving forces over the next 30 years — and we used these findings to construct four scenarios.

In addition, we created narratives to describe each scenario. The stories were complemented by various statistics describing the world, presented in charts. The story and the charts were compiled in a 12-page brochure to present a holistic picture of each scenario in words and numbers. We also developed five-minute long videos presenting a fictional newscast on a day in the distant future (November 2, 2037) in each scenario. The brochure and the video were used together to immerse the scenario users in the respective scenario before asking them to assess long-range investment decisions in particular elements of the freight infrastructure.

We mention all of this in order to illustrate that while scenario planning can obviously help leaders make smarter long-term decisions, effective scenario planning requires a great deal of legwork and research. Committing to it can be extremely beneficial — and we would recommend it — but it is a time- and resource-consuming effort.

## Scenario Planning as a Continual Practice

Our studies provide objective evidence that the use of scenarios influences executives' judgments about long-range, strategic decisions. But our study does not provide a comprehensive picture of the efficacy of scenario planning. The reason? Our results pertain to the effect of a one-time use of scenario planning on long-term decisions. However, we did not examine whether the continual practice of scenario planning would help executives improve when it comes to their long-term decision-making skills.

As Sarah Kaplan and Wanda Orlikowski pointed out in their 2014 *MIT Sloan Management Review* article, "Beyond Forecasting: Creating New Strategic Narratives," executives create narratives about the future when making strategic decisions. Often, these narratives are mere extrapolations of the present trends. Carefully crafted scenarios could provide executives with narratives that are not constrained by such myopic views. What's more, leaders can use multiple scenarios describing plausible visions of the world the organization may experience in the future. Using these multiple scenarios can help to ensure that the capital-intensive assets embodying the organization's strategy continue to serve the organization effectively over the assets' lifetime.

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