

Imaging Possible Futures with a Scenario Space

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The 9/11 Commission reported that the failure to anticipate and prevent the events of September 11th was as much a “failure of the imagination” as anything else. “It is therefore crucial,” concluded the Commission, “to find a way of routinizing, even bureaucratizing, the exercise of imagination.” We should be clear as to the type of imagination that is required here. Imagination, as I believe the 9/11 Commission intended it, refers to our ability to engage in thought experiments, specifically by taking the world as it is, altering a few variables in our mind, and thinking through the resulting “world.” Imagination in this sense is a “world-altering” thought process.¹ This differs from the kind of imagination as that practiced by science fiction writers, who engage in what we might term “world-replacing” thought experiments.² We often mean the latter sense when we believe that we are “letting our imaginations get away from us.” Imagination in the “world-altering” sense must be based on a grounding in reality, in that we never stray too far away from what is possible in this world. While the Commission’s recommendations certainly sound sensible, “bureaucratizing the exercise of imagination” is not an easy task. For those of an analytic bent, the exercise of imagination seems too subjective and imprecise to be useful. Those who are imaginative chafe at the idea of making this most creative of abilities routine and bureaucratic.

Those engaged in strategic foresight face this twin problem when it comes to imagination: they must develop the skill to imagine wild card, outlier, and other 9/11-type scenarios, but must also manage and organize the potentially limitless number of such scenarios in manner as to make them intelligible and actionable. They must develop the capacity for imagination without letting it get “too far away from them.”

Two characters from Neal Stephenson’s novel *Anathem* explore this problem of “the trouble with imagination.” “I am worried that you will leave,” exclaims one character. The other character asks “What does it mean that you worry so much? Describe worrying...pretend I’m some-

one who has never worried. Tell me how to worry” he says. (Keep in mind that these characters are philosophers in a monastery who regularly argue and dispute.)

“Well...I guess the first step is to envision a sequence of events as they might play out in the future...a sequence with a bad end.”

“So, you’re worried that a pink dragon will fly over [us] and fart nerve gas?”

“But [that’s] nonsensical, [dragons] don’t exist...one has never been seen,” the other retorts.

“But I have never been seen to leave the [monastery], yet you worry about that.”

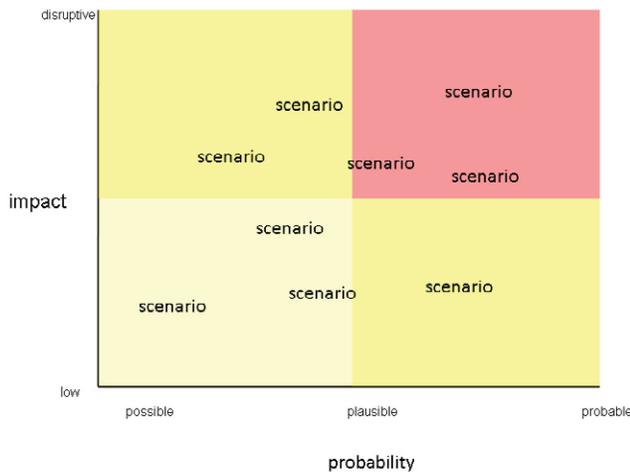
If you open up the possibility of non-existent or not-yet-existent events, this fictional character asks, “where do you stop?” Where are the boundaries between situations that are “mostly possible” from those that are “wholly impossible,” even if such situations are imaginable? Worry, in this instance, means being overcome by all of the possibilities the mind can conjure. One way to avoid worry, it would seem, would be to simply stop imagining and focus instead on what is right now, right at this moment.

This fictional character observes that the human mind does indeed possess the capacity to imagine innumerable possibilities that could lead to a condition of being overwhelmed by worry. To avoid this condition, we have the capacity to filter these possibilities and to organize them into those sequences of events that are plausible from those that are merely possible. Stephenson’s character posits that the mind is organized via a kind of configuration space that maps out all manner of possibilities, from the absurd and logically inconsistent to the very likely and probable. Our minds search through this configuration space, seeking those scenarios that are more likely to occur and ignoring those that are not.

What I propose here is a visualization tool that makes this internal mental configuration space concrete and visible. Below I detail an instrument called a “scenario space”³: organizations engaged in futuring and foresight processes might use this tool to encourage and manage their collective imagination.

A scenario space is designed to:

FIGURE 1: *A scenario space*



- Organize the imagination
- Act as a diagnostic tool respecting an organization’s imaginative capacity
- Encourage imaginative thought and peripheral visioning

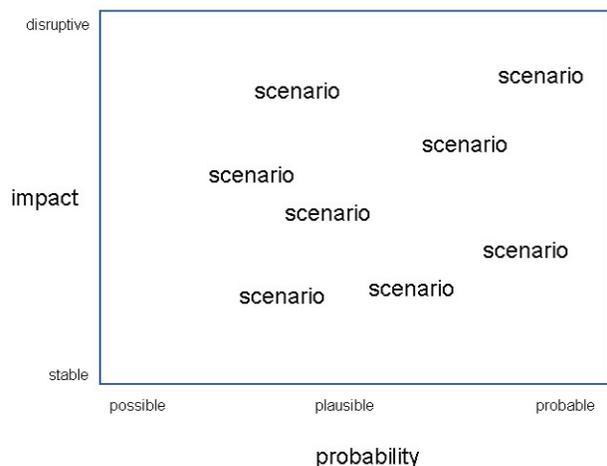
For purposes of employing this technique, I want to be clear about my definition of a scenario. A scenario will be defined here as a rich description of some possible future event. So, a scenario here might read “Terrorists begin a campaign of suicide bombings inside the United States, targeting public locations such as shopping malls, sports stadiums and universities.” A scenario space is a coordinate system within which all the scenarios generated by a group process are contained and displayed. A scenario space works in tandem with other expert judgment techniques; I prefer to use the Nominal Group Technique (NGT)⁴ as a way to generate ideas for scenarios, although a scenario space can also be used with analytic scenario generation processes as well. In the ngt process, experts respond to a topic question, such as “After 9/11, what types of terrorist acts are likely to be attempted within the borders of the United States?” The members of the group then begin by listing off, one participant at a time, an idea or thought that answers the topic question. This initial phase of the nominal group technique is based on idea generation; it is called a “nominal” technique because there is to be no discussion about the merits of the ideas so generated. After each participant produces one idea, the process is repeated for a second round and a third and so on until all ideas have been expressed. An advantage

of the nominal group technique is that its purpose is pure idea generation, encouraging imagination and outside-the-box thinking, even if those ideas seem wildly implausible at first glance.

After all the ideas have been generated—after all of the scenarios have been listed—then the members of the group score the results. In a traditional nominal group technique, the participants score what they believe to be the five most important ideas, or are sometimes asked to rank their top 5 picks in descending order (i.e. score 5 points to the most significant idea, score 4 points for the next most significant idea, etc.) For the scenario space exercise a different scoring procedure is involved. Instead of one score for each idea the participants offer two scores for each idea: one reflecting the potential impact of the scenario’s occurrence and one reflecting a qualitative assessment of the probability of the scenario’s occurrence. (Note: this is not a statistical probability, but rather a subjective Bayesian probability.⁵) Each participant provides a score based on a 1–5 scale: scoring the impact of the scenario with 1 being low impact/stable and 5 being high impact/disruptive and scoring the probability of the scenario with 1 being possible (but unlikely) and 5 being highly probable. Unlike the traditional scoring in a ngt exercise, every scenario developed during the exercise receives a score (not simply the 5 or so judged to be most important) and each score is reported as a set of coordinates (2, 4). After all of the scores have been tallied, the results are averaged, so that each scenario reflects a single point on the coordinate system of the scenario space.

A scenario space is therefore bounded by two axes, one representing the impact of the scenario, the other the

FIGURE 2: *Plotting scenarios within a scenario space*



probability of the scenario. Each scenario is then plotted within the scenario space. If time and circumstances allow, other scoring dimensions can be included, such as time horizon and the speed of change; color-coding each scenario red or green could reflect whether the scenario represents a threat or opportunity; font size of the scenario could reflect the amount of evidence supporting the scenario, etc., producing a multidimensional scenario space.

Scenarios in the upper right quadrant of the two-dimensional scenario space (high impact, high probability) are located in the region of “due diligence.”

If these scenarios are both highly likely and likely to be of high impact then they must be considered actionable events; a responsible organization should take action on these scenarios. Those scenarios that fall outside of this area—those with less impact and/or less probability—are situated in the region of “peripheral vision.”

Because they stand on the periphery of the “actionable future,” these are scenarios that need not necessarily be acted upon at the present moment. A scenario space provides a way to manage an organization’s perceptions about future scenarios, by distinguishing between those that are currently actionable and those that may presently be monitored on the periphery.

The array in a scenario space is not static. In the first place, new scenarios will emerge in the intervening time between scenario exercises. Because scenarios are based on an organization’s modifying perceptions about the future—based on new evidence or changes in perceptions as to the meaning of evidence—the scenarios will rarely remain in fixed locations within the scenario space over time. For example, a repeat of the exercise might reveal that the participants now feel that a scenario once deemed merely possible has become more probable. This is why scenarios that were initially plotted somewhere out on the periphery of the scenario space still bear watching, as they can “move” into the region of due diligence over time. (And, obviously, scenarios that were once considered highly probable in the region of due diligence could shift out into the peripheral region.) For example, three years ago a scenario described thus: “The [Iraqi insurgent group] Mahdi Army will lay down its arms, will now be guided by Shiite spirituality instead of anti-American militancy, and will focus on education and social programs,”⁶ had it even been considered a possibility by analysts of the Iraq War, would have surely resided in the yellow low-probability region of the scenario space. However, at the time of this writing this scenario has shifted closer to the region of higher probability.

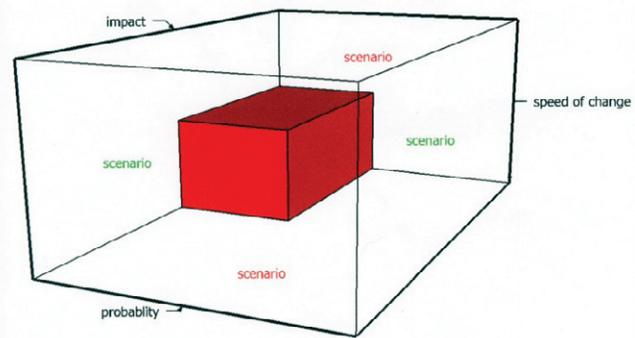


FIGURE 3: A multi-dimensional scenario space

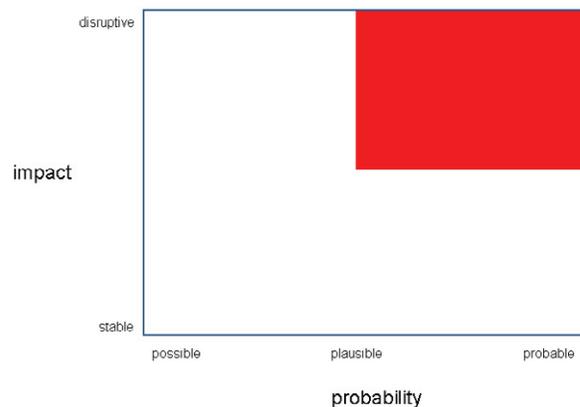


FIGURE 4: “Due diligence”

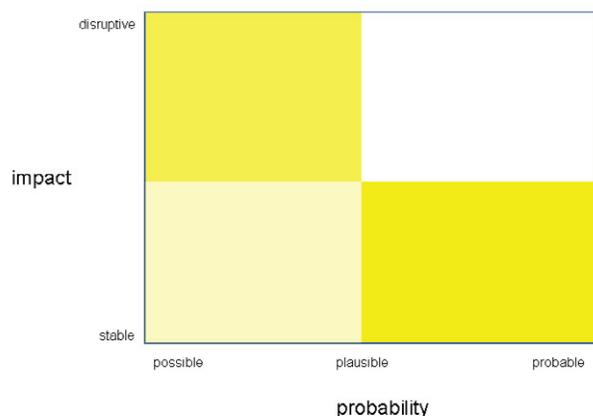


FIGURE 5: “Peripheral division”

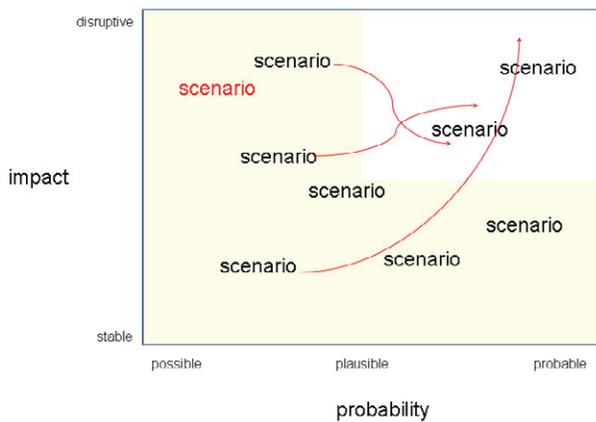


FIGURE 5: *Shifting scenarios (with a newly emerging scenario in red)*

Peripheral scenarios bear monitoring, since they reside in the region of the outliers, the wild cards and the “Black Swans,”⁷ they are the source of many of the “surprises” analysts often must confront. Surprise is born from this yellow peripheral region, not in the area of high impact/high probability. This peripheral region of the scenario space is comparable to our own ocular peripheral vision. For example, when driving a car, we are more likely to respond to those events occurring in our immediate direct vision; however, a good driver is always aware of events occurring in his field of peripheral vision. Well-developed peripheral vision leads to heightened awareness and anticipation of potential events. Similarly, a scenario space is designed to organize our peripheral vision of the future, to heighten our awareness and sharpen our anticipation of future scenarios.

A scenario space may also serve as a diagnostic tool as to an organization’s “imaginative capacity.” If, after an organization completes a strategic foresight exercise, the scenario space has all or most of its scenarios located in the region of “*due diligence*,” this may well reflect an organization that has not fully considered outliers and other wild cards on the periphery of the scenario space. The organization suffers from too little imagination. On the other hand, if the exercise produces nothing but scenarios located on the lower-impact, lower probability periphery, then the organization is overlooking obvious high-impact, high-probability events, and may in fact be suffering from a collective overactive imagination. Ideally, a successful scenario space exercise will produce a relative balance between the due diligence and peripheral zones.

A scenario space exercise must include a consideration of the larger *business space* in which the scenarios will occur. (By “business space” I mean the domain in which

an organization operates.) A business space is therefore defined by its dimensions, as each of these elements contributes to define the overall structure. Those of us in education, for example, might define our business space as a domain that is shaped by the attitudes of the incoming Millennial Generation, the political climate for funding for higher education, the intellectual and political orientation of the faculty, the actions of the administration, etc. A scenario space exercise begins when the participants are asked to “imagine their business space,” that is, to create a mental picture of the dimensions of the domain in question, since the goal of this foresight exercise is to imagine changes and alterations to this business space, alterations to such a space can be carried in our imaginations.

If there are far too few scenarios included within the periphery of the scenario space, then it is incumbent upon the organization to revisit their scenarios, and push their imaginations into this region by mentally altering some portion of their business space to produce new scenarios. There are many techniques for moving organizational imagination into this “peripheral zone.” One way to accomplish this is to examine “non-obvious trends.” Many organizations look only to their immediate business space when considering trends and scenarios for the future. For example, an insurance company looks only at the regulatory environment, the actions of their direct competitors, the health of the financial markets, etc. In looking only at their business space as narrowly and traditionally defined, these organizations will typically miss important trends that are occurring in some other business space, exogenous to their own, but whose impact could nevertheless migrate into their own business space. For example, film making companies such as Polaroid and Kodak were caught unaware of the implications of the digital computer for their businesses, as digital computing was not a part of the way these companies traditionally defined their business spaces. (What did a computer have to do with taking pictures?) In imagining a world-altering thought experiment that considered the digital computer as a means for taking pictures, these companies might have dealt with this threat to their film-making business more quickly and with greater agility. I once asked an insurance company “What would the Starbuck-ization of your business space look like?” None in the room had considered such a (to them) seemingly outlandish scenario. (“What does coffee have to do with selling insurance?”) This is a non-obvious trend, and if placed within a scenario space would surely fall under the high impact/low probability quadrant. But considering this non-obvious (for an insurance company) trend is a way to push the imagination into the peripheral zone of the scenario space.

History—specifically, historical analogies—provides a rich palette of possibilities from which to draw imaginative scenarios. The analyst who wishes to extend his imagination into the yellow zone might consider events, ideas and structures from the past and imagine what they might look like in the present situation. Answering the question “Who might the Mao of 21st century China look like?” could produce a scenario that, even if somewhat improbable in the present, might nevertheless unfold and shift toward the red zone at some future date. It is especially useful to mine the past for non-obvious analogies, and imagine what these structures would look like in the context of some future scenario. We could ask, for example, “What would be the effect of the emergence of a Marcus Garvey within the Muslim world?” and explore a scenario with this non-obvious analogy as its guiding principle.

Historical analogies also provide us with a source of “dormant scenarios.” The recent war between Georgia and Russia, for example, has led some to wonder if we are not witnessing a revival of the Cold War, thought to be resolved some time ago. What other dormant scenarios are possible in the future? Might we imagine “the return of Saddam Hussein?” (This means, of course, the return of a similarly ruthless dictator in Iraq, who purges his enemies from a democratically or pseudo-democratically elected parliament in order to establish himself in power.) *The Economist* has recently written about a seemingly resurgent Russia, “Russia can make mischief, but it cannot project military and ideological power all around the world, as the Soviet Union did during the cold war.”⁸ The analyst engaged in a foresight exercise might nevertheless imagine the implications of such a resurgence of Russian power. How might Russia attempt to project its power in the 21st century? With what effects? How might China respond? Where might Russia attempt to project such power? Answering such “what if?” questions produces a rich source of potential future scenarios.

Pushing our imaginations in this fashion is similar to the kind of thought process historians use when imagining counterfactuals. That is, we can use the same kinds of mental processes to generate “what if?” future scenarios that we use to generate “what if?” counterfactuals of the past. When imagining a counterfactual, we make a mental representation of some reality, alter some important variables and then think through the consequences of the world so altered. Counterfactual thinking is part of our everyday mental activity. For example, I might be driving into work and be caught in a traffic jam caused by an accident a mile ahead. I might think to myself “if only I had left easier this morning, I would have missed this traffic jam and been on

time for the meeting.” More formally, some political scientists and historians use counterfactual thinking to profitably think through issues of causation in the past. For example, we might imagine a Soviet Union without Mikhail Gorbachev as its leader, and then think through Soviet-American relations were a more Brezhnev-like leader to have emerged—say, had Chernenko lived longer or had been replaced by someone like Chernenko.⁹ Given what we know of Ronald Reagan, how might he have reacted to a different Soviet leader? Imagining such a counterfactual allows us to consider the causal role and impact Gorbachev—and Reagan—had on the end of the Cold War.

Psychologists who study counterfactual thinking in everyday cognitive activity observe that when we mentally alter some facet of our reality in order to generate a counterfactual we tend to focus on those portions of our reality that seem the most malleable, mutable and “slippable.” “Different people,” writes the psychologist Ruth M. J. Byrne, “tend to change the same sorts of things when they think about how things might have been different. These regularities indicate that there are ‘joints’ in reality, junctures that attract everyone’s attention. There are points at which reality is ‘slippable.’”¹⁰ Not surprisingly, the most slippable or mutable joints tend to be those based on human action.

I believe that our mental representations of the reality of the future also contain joints and fissures and junctures that we can “slip” in order to imagine future scenarios. Learning how to locate these joints is an important object of imagination exercises. In examining/imagining a business space, the analyst seeks out those regions that are mutable and slippable, for these are a potential source of scenarios.

When performing imagination exercises with clients, I will often listen attentively for their “unexamined assumptions.” I am especially interested in “never scenarios,” as when I hear participants tell me “That will never happen.” Unless the “never” in question is related to the laws of physics, “never scenarios” present even the possibility of actually occurring (these would be, typically, low-probability scenarios). For example, one might say “Since the Chinese and the Japanese have such long-standing issues with each other, they will never cooperate with each other.” While there may be a fair amount of truth in this assertion, the responsible imagination leader nevertheless considers the implications of a “never scenario” that actually occurs. In such an imagination leadership exercise, one might imagine a scenario in which the Chinese and Japanese establish a defense pact, with the Japanese shunning their decades-long military agreements with the United States, especially as China emerges as a strong competitor to United States interests in the region. At present, such a scenario seems

unlikely, and so belongs in the yellow low probability—but very high impact—region. But, although on the periphery of our imagination, we now have a heightened sense of awareness, and might now begin to watch for signs of any sort of Chinese/Japanese rapprochement, signs we might have missed had we not considered such an unlikely “never scenario.”

“Always scenarios” are also rich with imaginative possibilities. Recently, CNN published a list of “twelve jobs that will always be needed:” doctor, teacher, mortician, waste disposal manager, scientist, tax collector, barber, soldier, religious leader, law enforcement officer, farmer, and construction worker.¹¹ The imagination leader interested in expanding imaginative capacity might ask a group to nevertheless imagine scenarios where we no longer need doctors or teachers or soldiers. What would such a world look like and how might it come about? The resulting scenarios might be seem highly improbable, but rather than ignoring or overlooking them, considering such “always scenarios” and then placing them within scenario space makes them part of our peripheral attention. Those who articulate always and never scenarios assume that these facets of the business space are not slippable or mutable. Always and never scenarios are assumed continuities, in that we believe they cannot or will not change. Making these seemingly unslippable joints more malleable is a useful way to imagine new possibilities, to push our imaginations deeper into the yellow peripheral zone.

We can also apply a scenario space as a tool for imagining outlier scenarios to the phenomenon of *Black Swans*. Nassim Nicholas Taleb defines a Black Swan as:

- a high-impact event
- an *outlier*, outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility
- 3) predictable only in retrospect.¹²

What he terms “Black Swan logic” makes “what we don’t know more relevant than what we do know,” because for Taleb, Black Swans are more the norm, not the exceptions that our Gaussian-influenced statistical thinking might lead us to believe.

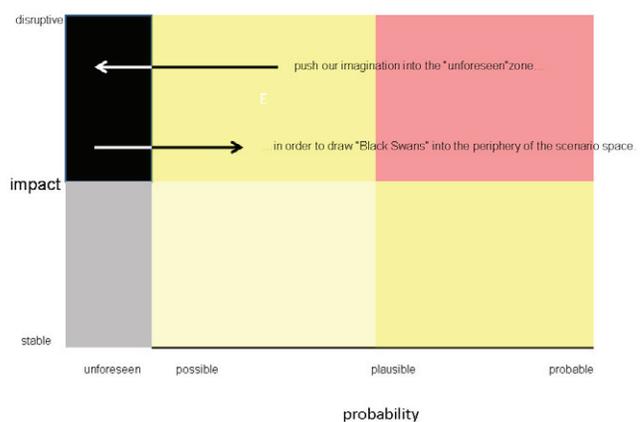


FIGURE 7: *Black Swans*

Because of their unpredictability and their deviations from our normal expectations, we cannot possibly anticipate all of the Black Swans that might exist. But we can, nevertheless, imagine some Black Swans. This requires even more intense “imagination” to bring them within the scenario space. Because they are outliers, with extremely low probability but with very high impact, Black Swans already have a place within the scenario space, although some of these must surely exist in a region even outside of the scenario space itself. I make a distinction when discussing the probably of a scenario this way:

- *Probable*: Very high likelihood of occurring
- *Plausible*: A realistic scenario, but with less probability
- *Possible*: Logically consistent and imaginable, but highly unlikely to occur.¹³

A Black Swan, as Taleb would define it, would fall even outside of this range of possibility: we might call them “unforeseen” scenarios. In order to deal more effectively with Black Swans, we need to “drag them” into the scenario space by making them conceptually “possible.”

By virtue of the fact that we can articulate even a highly unlikely scenario—by conjuring it up in our imagination and stating this mental vision in words—we move it from the realm of unforeseen into the realm of the possible, and thus within our zone of peripheral vision. If a scenario is imaginable—even if unlikely—it is therefore possible. Many of the techniques above can be used fruitfully to imagine Black Swans: to imagine the unimaginable.

For a variety of reasons, not all actionable scenarios are capable of literally being acted upon. Furthermore,

scenarios in the improbable yellow peripheral zone might nevertheless occur, despite their improbable nature and even if they have been monitored via an organization's peripheral vision. As with all efforts to anticipate the shape of the future, a scenario space is not a fool-proof system. But if the goal is to expand our imaginative capabilities and to make these a routine part of how we monitor trends and scenarios, then the scenario space is an effective tool for ordering our perceptions and expanding our imaginations.

Imagination leadership is the practice of cultivating and coordinating individual and organizational imagination for purposes of thinking about and anticipating the future. "Imagination" does not mean mere "make believe," rather, imagination is that underutilized portion of the organizational mind that perceives associations, possibilities, analogies, lateral thoughts, and "what ifs?" It is that area of the mind that allows us to picture the world, then alter it and reshape it in our minds. Imagination is the mental space that allows us to perform these thought experiments.

"Leadership," in this context, means the thoughtful coordination of the act of imagination. In an organizational setting: this means creating the conditions by which imagination can flourish, but also providing a rigorous shape and structure to the exercise of imagination. The imagination leader strikes a balance between play and rigor as a way to unleash the imagination. In this sense, imagination leadership is similar to thought leadership, in that what is led is people (not technologies or mere information), and specifically the knowledge, experience, wisdom and judgment of thoughtful practitioners. The goal of "imagination leadership" is to establish procedures and processes that liberate and organize the imagination; a scenario space is a useful tool for managing the imaginative process.

BIOGRAPHY

David J. Staley, Ph.D. is an adjunct associate professor and Director of the Goldberg Center for Excellence in Teaching in the Department of History at The Ohio State University. He is principal of The DStaley Group, a strategic foresight and imagination leadership consulting firm, and is president of Columbus Futurists, the local chapter of the World Future Society. He is the author of *History and Future: Using Historical Thinking to Imagine the Future* (Lanham MD: Lexington Books, 2007). A "humanities-based imagist," Staley has also designed exhibitions, installations and other information visualizations.

NOTES

1 Nicholas Rescher, *Imagining Irreality: A Study of Unreal Possibilities*, (Chicago: Open Court, 2003), 223.

2 Ibid.

3 See David J. Staley, *History and Future: Using Historical Thinking to Imagine the Future* (Lanham MD: Lexington Books, 2007), especially 88–93.

4 On the nominal group technique, see Stephen M. Millett and Edward J. Honton, *A Manager's Guide to Technology Forecasting and Strategy Analysis Methods* (Columbus: Battelle Press, 1991), 55–60.

5 Bayesian probabilities are based on expert judgment, are "a measure of a state of knowledge," and are "a measure of the plausibility of an event given incomplete knowledge." See Charles Annis, "Bayesian Thinking," http://www.statisticalengineering.com/bayes_thinking.htm (accessed September 5, 2008).

6 *Wall Street Journal*, "Radical Iraq Cleric In Retreat," Tuesday, August 5, 2008, A1.

7 See Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable* (New York: Random House, 2007).

8 *The Economist*, August 23, 2008, 11.

9 Mark Almond, "1989 Without Gorbachev: What if Communism Had Not Collapsed?," in Niall Ferguson, *Virtual History: Alternatives and Counterfactuals*, (New York: Basic Books, 1997), 412.

10 Ruth M.J. Byrne, *The Rational Imagination: How People Create Alternatives to Reality*, (Cambridge: MIT Press, 2005), 3.

11 "The top indestructible careers," <http://www.cnn.com/2007/LIVING/worklife/07/11/cb.survival/index.html> (accessed September 5, 2008).

12 Taleb, xvii-xviii.

13 Think of a courtroom drama like *Law and Order*, when the defense attorney badgers an expert witness into testifying that such-and-such an occurrence is “possible,” thereby hoping to raise doubt in the mind of the jury. But the expert knows that “possible” in this case also means “hardly any chance of occurring.”

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