

Strategic Foresight Nine Techniques for Business and Intelligence Analysis

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Abstract

Analysts and decision makers can use nine different Strategic Foresight techniques to anticipate the outcomes of struggles in such places as Syria or the Ukraine and over a longer time frame to assess the impact of global climate change or trends in cyber warfare. The primary objective in using Foresight Analysis is to avoid surprise, but the techniques often prove just as valuable in mapping the future and identifying new opportunities for business or government. The best way to ensure the success of a Foresight Analysis workshop is to be explicit about the purpose of the exercise, adopt a team process, involve a diverse group of participants, engage decision makers in the process, and use a decision support tool to generate a follow-on action plan. Establishing explicit criteria is important for selecting which scenarios to present to the decision maker and develop a robust and validated set of indicators for each alternative scenario.

Keywords: *Intelligence, International Conflict, Methodology, Scenarios, Forecasting, Prediction*

The Power of Foresight Analysis

Foresight Analysis is one of the most powerful but underused methods in an analyst's quiver. When a policymaker or corporate executive is asked, "What is the most important thing an analyst can do for you?" two of the most common responses are: "Make sure I am never surprised" and "Frame an issue for me so that I can better understand how I can influence the outcome." Foresight Analysis excels at both these tasks.

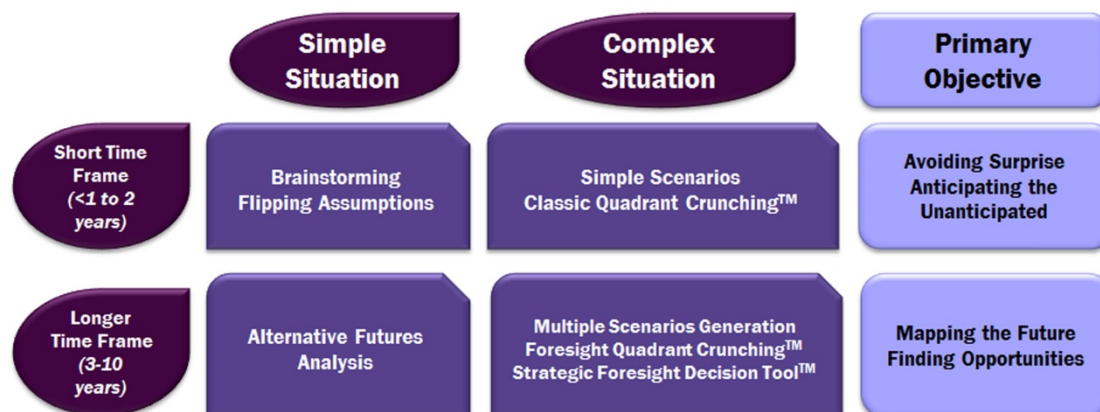
The classic dictionary definition of foresight is "the ability to anticipate what will happen in the future." In this paper, Foresight Analysis is defined as essentially a reframing process that involves "the exploitation of insight(s) to create a state of being prepared for thinking, seeing, and acting in the future."ⁱ Foresight Analysis helps analysts undertake estimative analysis, which is defined as thinking systematically about the various ways the future is likely to unfold and what is most likely to determine the eventual outcome. Foresight Analysis is a more complex process and is distinct from prediction (defined as making a definitive statement about what will happen in the future) or forecasting (defined as making a qualified statement or calculation of some future event or condition based on the results of study and analysis of the available data).

Foresight Analysis is most useful when a situation is complex and the outcome too uncertain to trust a single prediction. When decision makers and analysts first come to grips with a new situation or challenge, a degree of uncertainty always exists about how events will unfold. At this point, when national policies or long-term corporate strategies are in the initial stages of formulation, Foresight Analysis can have a strong impact on decision makers' thinking by generating a set of alternative trajectories that help illustrate how the future could unfold. The objective of Foresight Analysis is not to predict the future, but to generate a solid set of scenarios that can bound the range of plausible alternative futures. The decision maker then can develop strategies for dealing with each alternative future, looking for ways to help make beneficial scenarios come about while avoiding or mitigating the potential damage of undesirable scenarios.

Foresight Analysis techniques accomplish a range of objectives (see Figure 1).

- When focusing on relatively short time frames involving no more than a few years, Foresight Analysis encompasses techniques that are effective tools for avoiding tactical surprise and anticipating what is not currently expected based on expert-driven analysis of existing trends and dynamics. Their power lies in their ability to force analysts to rethink problems or view them from a new perspective by employing a systematic process involving a series of steps to reframe the issue in new ways.
- When focusing on a longer time frame of several years or decades, Strategic Foresight Analysis can help decision makers map the future. In so doing, they can identify strategic threats to avoid or mitigate as well as new opportunities to exploit. Strategic Foresight Analysis usually involves the following stages: identifying key drivers, generating mutually exclusive scenarios, and using indicators to gain forewarning of which alternative future is actually emerging.

Figure 1. Taxonomy of Foresight Analytic Techniques



Obstacles and Strategies

Thinking about the future does not come naturally to most analysts. Change sometimes happens so gradually that analysts do not notice it, or they rationalize it as not being of fundamental importance until it is too obvious to ignore. Once analysts take a position on an issue, they typically are slow to change their minds in response to new evidence. By going on the record in advance to specify what actions or events would be significant and might change their minds, analysts are better able to adjust their mental mindsets.

When the author served as a National Intelligence Officer (NIO) on the US National Intelligence Council, he was always looking for the best and the brightest analysts in the Intelligence Community to draft National Intelligence Estimates. What surprised him and his fellow NIOs was that many of the best analysts lacked the necessary skills to write good estimates. Most of the drafters needed mentoring on how to organize and craft an estimative paper. In fact, the National Intelligence Council proposed on numerous occasions that analysts take special workshops on how to write about the future.

Analysts have so much difficulty crafting a good Foresight Analysis paper because of cognitive limitations or biases that are familiar to all of us, including:

- Our view of the future is usually firmly anchored in what we have experienced in the past.
- We believe most answers are to be found, not created or imagined.
- We cannot consider what we have never imagined.
- Our brains are not programmed to think systematically about what the future will bring.

Strategic Foresight Analysis provides a mechanism to help the analyst avoid, overcome, or at least mitigate these cognitive challenges by requiring the analyst to use structured techniques that ensure the analysis will be systematic and rigorous (see Figure 2). Cognitive biases are inherent thinking errors that people make in processing information. They prevent an analyst from accurately understanding reality even when all the needed data and evidence that would form an accurate view is in hand.

Figure 2. Cognitive Biases Mitigated by Foresight Analysis

Foresight Analysis helps analysts mitigate several cognitive biases, including:	
Anchoring Effect	Accepting a given value of something unknown as a proper starting point for generating an assessment.
Availability Heuristic	Judging the frequency of an event or category by the ease with which instances of this comes to mind.
Confirmation Bias	Seeking only information that is consistent with the lead hypothesis, judgment, or conclusion.
Groupthink	Choosing the option that the majority of the group agrees with or ignoring conflicts within the group due to a desire for consensus.
Hindsight Bias	Claiming the key items of information, events, drivers, forces, or factors that actually shaped a future outcome could have been easily identified.
Mirror Imaging	Assuming that others in similar circumstances will act the same as we would.
Premature Closure	Stopping the search for a cause when a seemingly satisfactory answer is found before sufficient information can be collected and proper analysis can be performed.

The best way to overcome these obstacles is to employ a rigorous methodology that stimulates creative thinking, helps bound the problem, identifies new opportunities, and offers a comprehensive framework for understanding how the future will evolve. The nine techniques described below suggest a variety of strategies for conducting Foresight Analysis. Each technique has its own strengths and weaknesses; care should always be taken to select the technique most appropriate to the analytic task at hand. Some can be done with a small group in an hour and others involve much larger groups and can take several days. Most require the assistance of a facilitator or a team of facilitators (see Figure 3). All would benefit from having a trained facilitator to guide the process and make methodological “course corrections” when circumstances merit adjusting the method.

Figure 3. When to Use Foresight Analysis Techniques

Foresight Technique	When To Use It	Typical Number of Participants	Facilitator(s) Needed?
Simple Situations			
Brainstorming	To stimulate creative thinking in an unstructured way	3-8	Yes (single person)
Flipping Assumptions	To challenge established mindsets or conventional wisdom by reframing key elements of the problem	3-5	No
Alternative Futures Analysis	To generate multiple stories of how the future will unfold, based on two highly influential key drivers or dimensions	24-40	Team (usually four)
Complex Situations			
Simple Scenarios	To generate multiple alternative scenarios when several key drivers are present	3-12	Recommended
Cone of Plausibility	To generate a mainline scenario and range of plausible alternatives based on key drivers and working assumptions	3-12	Yes (single person)
Classic Quadrant Crunching™	To anticipate unknown unknowns and avoid surprise in highly ambiguous situations with an established lead hypothesis	24-40	Team (usually four)
Multiple Scenarios Generation	To generate a set of mutually exclusive scenarios by arraying key drivers in sets of 2 x 2 matrices	24-40	Team (usually four)
Foresight Quadrant Crunching™	To develop multiple scenarios by generating credible permutations focusing on who, what, how, where, when, and why	24-40	Team (usually four)
Strategic Foresight Decision Tool™	To generate policy options or strategies to prevent or mitigate bad scenarios and boost preferred outcomes.	24-50	Team (usually four)

Techniques for Simple Situations

Foresight techniques are designed to force the analyst out of traditional patterns of thinking and overcome the tendency to predict or forecast the future by simply extrapolating from the past. Three of the most common simple techniques are Brainstorming, Flipping Assumptions, and Alternative Futures Analysis. The first two techniques are most effective if the group consists of at least three but no more than eight individuals; Alternative Futures Analysis usually involves a larger group numbering between 24 and 40 participants.

Brainstorming is a simple and well-established mechanism to stimulate creative thinking about alternative ways the future might unfold. The brainstorming session should be a structured process that follows specific rules (see Figure 4).ⁱⁱ A

downside risk for using brainstorming to generate scenarios is that there is no guarantee that all the scenarios generated are mutually exclusive. The tendency also is to draw heavily from past experiences and similar situations, and thus fall victim to the Availability Heuristic.

Figure 4. Eight Rules for Successful Brainstorming

1.	Be specific about the purpose and the topic of the brainstorming session.
2.	Never criticize an idea, no matter how weird, unconventional, or improbable it might sound. Instead, try to figure out how the idea might be applied to the task at hand.
3.	Allow only one conversation at a time and ensure that everyone has an opportunity to speak.
4.	Allocate enough time to complete the brainstorming session.
5.	Engage all participants in the discussion; sometimes this might require “silent brainstorming” techniques, such as asking everyone to be quiet for five minutes, write down their key ideas on a 3x5 card, and then discuss what everyone wrote down on their cards.
6.	Try to include one or more “outsiders” in the group to avoid Groupthink and stimulate divergent thinking. Recruit astute thinkers who do not share the same body of knowledge or perspective as other group members but have some familiarity with the topic.
7.	Write it down! Track the discussion by using a whiteboard, an easel, or sticky notes.
8.	Summarize key findings at the end of the session. Ask the participants to write down their key takeaway or the most important thing they learned on a 3x5 card as they depart the session. Then, prepare a short summary and distribute the list to the participants (who may add items to the list) and to others interested in the topic.

Flipping Assumptions is another simple but highly effective reframing technique for generating alternative scenarios. The method is straightforward. Make a list of assumptions; identify one or more assumptions that would have major impact; and assume that for whatever reason the assumption is invalid and the contrary assumption has turned out to be true. Ask yourself how flipping that key assumption would affect what is forecast or change the expected outcome. If the impact would be significant, ask if a credible case can be made that the assumption—under certain circumstances—could turn out to be untrue. This credible case then can be converted into an alternative scenario. The process can be repeated for several key assumptions, generating a set of plausible alternative scenarios.

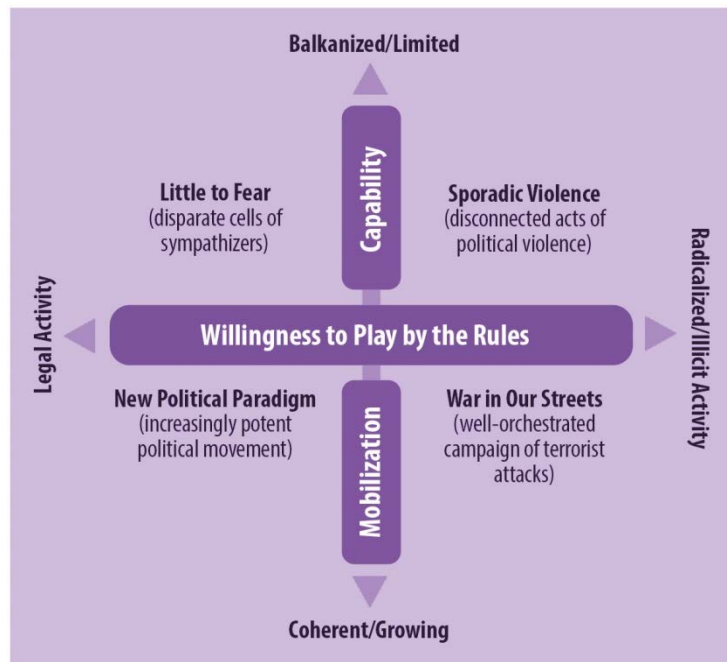
Alternative Futures Analysis is a systematic method for identifying alternative trajectories by developing plausible but mind-stretching “stories” based on critical uncertainties to inform and illuminate decisions, plans, and actions today. A team of experts can spend several hours or days organizing, brainstorming, and developing multiple futures. A large, multi-day effort often demands the special skills of trained facilitators knowledgeable in the mechanics of Alternative Futures Analysis. The technique has proven highly

effective in helping analysts, decision makers, and policymakers contemplate multiple futures, challenge their assumptions, and anticipate surprise developments by identifying “unknown unknowns.” “Unknown unknowns” are best defined as those factors, forces, or players that one did not realize were important or influential before commencing the exercise.

In the classic version of Alternative Futures Analysis, four different worlds are defined by creating a single 2 x 2 matrix based on two key drivers. An example of an Alternative Futures Analysis is provided in Figure 5.ⁱⁱⁱ The robust alternative futures methodology was first developed by a team at the Royal Dutch Shell Company in the 1980s. A detailed description of the process and the power of the technique is provided by Peter Schwartz in *The Art of the Long View*.^{iv} Use of the technique usually

requires the assistance of a team of knowledgeable facilitators. Do not use this technique if the target of the study is being influenced by more than two critical drivers.

Figure 5. Alternative Futures Analysis: How Might Domestic Radical Extremist Groups Evolve?



Strategic Techniques for Complex Situations

Foresight Analysis techniques that generate a large set of alternative futures are powerful instruments for overcoming well-known cognitive biases such as Groupthink, Mirror Imaging, and Premature Closure. Strategic Foresight Analysis requires building a diverse team that is knowledgeable in a wide variety of disciplines and, by operating as a collective, helps guard against cognitive bias. Moreover, the process of developing key drivers and using them in combinations to generate a wide array of alternative trajectories forces analysts to think about the future in ways they would have never contemplated if they relied solely on intuition and their own expert knowledge.

Another benefit of Strategic Foresight Analysis is that it provides an efficient mechanism for communicating complex ideas. A scenario is a set of complex

ideas that can be described with a short label. These labels provide a lexicon for thinking and communicating with other analysts and decision makers about how a situation or a country is evolving.

Simple Scenarios, Cone of Plausibility, and Classic Quadrant Crunching™ should always be done with a group; the more diverse the group, usually the more valuable the final product. These techniques help analysts define and bound the problem as well as avoid surprise. Multiple Scenarios Generation, Foresight Quadrant Crunching™, and the Strategic Foresight Decision Tool™ are more robust processes often geared toward decision support. They are best done with a large number of diverse participants and often include the customer or decision maker in the process itself.

The **Simple Scenarios** technique is relatively straightforward. This approach and several others benefit from the use of a trained facilitator who can manage the group dynamic, keep the participants on track, and demonstrate agility in deciding what is needed and when. The key steps are to brainstorm a set of five to ten key drivers and then generate at least four different scenarios—a worst case, mainline analysis, new opportunity, and at least one other by assigning different values (+, -, or neutral) to each driver.▼

Figure 6. Simple Scenarios: Generating Alternative Scenarios for Caldonia

	An Imperfect Peace	Descent Into Order	Pockets of Civility	Fragmentation
Govt. Capacity	+	-	-	-
Insurgency	-	+		+
Economy	+	-		
Paramilitaries	-	+		+
Civil Society			+	
Drug Trade				+
External Actors				

Figure 6 demonstrates how this technique would work when conducting a Simple Scenarios exercise on the fictitious country of Caldonia, which is facing a chronic insurgency and a growing threat from narcotics traffickers. In this example, “Fragmentation” represented the downside scenario, “Descent Into Order” the mainline assessment, “An Imperfect Peace” a new opportunity, and “Pockets of Civility” the emerging trend.

One of the greatest challenges in conducting Foresight Analysis is to generate a set of attention-deserving scenarios that is comprehensive, mutually exclusive, and optimally supports the needs of the primary customer. A large number of participants are usually involved in the scenarios generation process, but the actual choice of scenarios when using Simple Scenarios or any other Strategic Foresight technique is most often made by a much smaller group that usually involves the exercise sponsors and facilitators. The process is largely subjective, given the usually large number of potential candidate scenarios and the diversity of stories generated. For these reasons, all participants must know the

criteria selected for use to generate the final set of scenarios. They also should be given an opportunity to validate and refine the list.

Figure 7 lists five criteria that are often used in choosing which scenarios are the most important to bring to the attention of the decision maker or ultimate customer of the exercise. The list should be tailored to the ultimate customer's needs and should fully answer the focal question asked at the beginning of the exercise.

- **Downside Risk.** The first criteria addresses the question most often asked: "How bad can it get?" The response should be a credible scenario that has a reasonable chance of occurring and should require the development of a contingency plan for avoiding, mitigating, or recovering if the selected scenario comes to pass. A Nightmare Scenario that can also be described as a High Impact/Low Probability Scenario is usually best portrayed in a tone box or text box in the paper and not as its own stand-alone scenario.
- **Mainline Assessment.** Most customers will usually ask "What is most likely to happen?" The honest answer is usually "We do not really know; it depends on how the various key drivers play out in influencing future developments." Although the purpose of Foresight Analysis is to show that several scenarios are possible, scenarios can usually be ranked in order from which scenarios are most to least likely to occur based on current trends and reasonable key assumptions. Providing a mainline scenario also establishes a convenient baseline for conducting further analysis and deciding what actions most need to be taken.
- **New Opportunity.** Every Foresight Analysis should include at least one scenario that lays out how decision makers can fashion a future much more to their liking. In every adversity, an opportunity can always be found. The various Foresight Analysis processes discussed in this paper are just as effective in developing positive, opportunities-based scenarios as in describing all the bad things that can happen.
- **Emerging Trend.** Often when conducting Foresight Analyses, new factors will emerge or new trends will be identified that had previously escaped the attention of analysts or decision makers. These new trends, relationships, or dynamics often are integral to or reflected in several of the scenarios that have been generated and can be collapsed into a single scenario that best illustrates the significance of—and opportunities presented by—the new trend.

Figure 7. Criteria for Selecting Attention-Deserving Scenarios

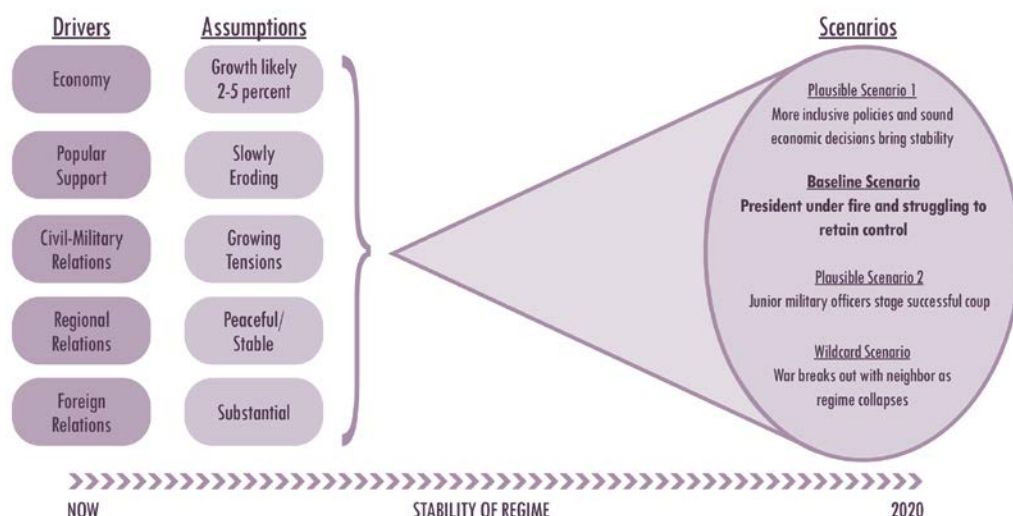
Select 3 to 5 scenarios that as a set reflect:	
1.	The most credible downside risk
2.	The consensus or mainline assessment
3.	A new opportunity
4.	A new or previously unexamined trend or dynamic
5.	A scenario the customer will recognize and find credible

- **Recognizable Anchor.** If none of the scenarios presented to the primary customers for the Foresight Analysis exercise appear credible or likely based on their past experience or convictions, then the customers will likely disregard the entire process and ignore key findings or discoveries made. On the other hand, recipients who find a scenario that resonates with their current world view will anchor their understanding of the exercise on that scenario and more easily understand how the alternatives were derived.

The **Cone of Plausibility** is a structured process using key drivers and assumptions to generate a range of plausible alternative scenarios that help analysts and decision makers imagine various futures and their effects. Its value lies in showcasing the drivers that are shaping current and future events; it also has proven a highly effective tool for strategic warning. It can be used to explore how well or how poorly events might unfold, thereby bounding the range of possibilities for the decision maker. Impactful but unlikely scenarios can be recorded separately in tone boxes or text boxes alongside the narrative.

The first step, as with Simple Scenarios, is to develop a list of key drivers (see Figure 8).^{vi} A second list of assumptions describing how the drivers will play out is also generated. An initial baseline scenario is developed based on the premise that the key drivers will remain constant throughout the period of the estimate and the assumptions are well-founded. The next step is the most critical and the most challenging. The analyst, or preferably the analytic team, needs to construct one to three alternative scenarios by changing an assumption or several of the assumptions in the initial list. The team then considers the impact that change is likely to have on the baseline scenario and describes this new end point and how it came about. It is also important to consider what impact changing one assumption would have on the other assumptions on the list.

Figure 8. Generating Scenarios with the Cone of Plausibility



Classic Quadrant Crunching™ is most useful when a well-established lead hypothesis exists that can be articulated clearly. Analysts find it helpful when dealing with highly ambiguous situations for which little data is available and the chances for surprise are great. The technique requires a facilitator unless the analysts are well-practiced in its application. Classic Quadrant Crunching™ initially was developed to help counterterrorism analysts discover all the ways radical extremists might mount a terrorist attack. But analysts have applied it more broadly to generate a wide range of potential outcomes, many of which have not previously been contemplated.

The technique forces analysts to rethink an issue from a range of perspectives and systematically challenge all the assumptions that underlie their lead hypothesis. As a result, analysts can be more confident that they have considered all possible permutations for a particular situation. In so doing, they are more likely to anticipate all the ways a situation can develop and spot lead indicators that signal a specific outcome is starting to occur.

Classic Quadrant Crunching™ combines the techniques of Flipping Assumptions and Multiple Scenarios Generation. It greatly reduces the potential for surprise by providing a structured framework with which the analyst can generate an extensive array of alternative scenarios or stories (see Figure 9). By critically examining each assumption and how flipped assumptions might play out, analysts can better assess their confidence in their predictions, the strength of their lead hypothesis, and the likelihood of their scenarios.

Figure 9. Using Classic Quadrant Crunching™ to Create a Robust Set of Stories

Number of Spectrums	Number of Matrices Generated	Total Number of "Stories" (4 per Matrix)
3	3	12
4	6	24
5	10	40
6	15	60

The Classic Quadrant Crunching™ process also helps decision makers focus on what actions need to be undertaken today to be best prepared for events that could transpire in the future. By generating an extensive list of potential outcomes or scenarios, decision makers are in a better position to select those that seem most credible and most deserving of attention. They then can take the necessary actions to avoid or mitigate the impact of bad scenarios and help foster preferred outcomes. The technique also can be used to sensitize decision makers to potential "wild cards" or "nightmare scenarios" that could have significant policy or resource implications.

The technique begins with a lead hypothesis, identification of the assumptions that underlie the lead hypothesis, or dimensions that focus on Who, What, How, When, Where, and Why. Once the key dimensions of the lead hypothesis are articulated, the group generates at least two examples of contrary dimensions. Figure 10 provides an example of how this technique can be applied to the question “How might terrorists attack a nation’s water system?”^{vii}

Figure 10. Flipping Assumptions to Generate Alternative Scenarios

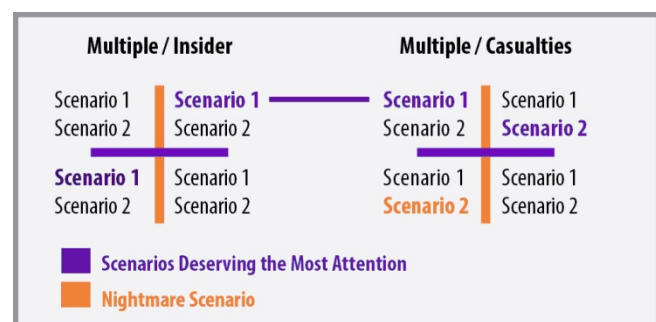
Key Assumption	Contrary Assumption	Contrary Dimensions
Single Attack	Multiple Attacks	Simultaneous Cascading
Contamination	Other Strategies	Denial of Service Water as a Weapon
Drinking Water	Waste Water	Treatment Plants Sewage Pipes
Outsider	Insider	Staff Employees Contractors/Visitors
Major Casualties	Minor Casualties	Terrorize Population Economic Disruption

The various flipped dimensions are arrayed in sets of 2 x 2 matrices. Different stories or alternatives would be generated for each quadrant in each matrix. Once a rich array of potential alternatives is generated, the group’s task is to identify which of the alternative stories are the most deserving of attention. The last step is to develop lists of indicators for each story to track whether a particular story is beginning to emerge.

Multiple Scenarios Generation is a systematic method for brainstorming multiple explanations of how a situation may develop when considerable uncertainty and several underlying key drivers are present. The method is similar to Alternative Futures Analysis, except that more than two drivers can be incorporated into the analysis. Analysts first identify a set of Key Drivers and then array these drivers in 2 x 2 matrices, generating different stories for each quadrant in the matrix. Once a large number of potential alternatives has been created, the group’s task is to identify which of the various alternatives are the most impactful—good or bad—and deserving of attention using a pre-established set of criteria (see Figure 11). Diagnostic indicators are then generated for each story to track which particular scenario is beginning to emerge.^{viii}

The technique has been used successfully in the US Government and the EU to explore the many ways a situation might evolve, anticipate surprise developments, and generate field requirements when dealing with little concrete information or a highly ambiguous or

Figure 11. Selecting Attention-Deserving Scenarios



uncertain threat. It has also been used as an investigative tool, providing an ideal framework for developing indicators and formulating requirements for field collectors and researchers.

Multiple Scenarios Generation, as with Classic Quadrant Crunching™, helps analysts and decision makers expand their imagination and avoid surprise by generating a robust set (usually 24 to as many as 60) of potential scenarios. This sensitizes them to possible new outcomes and makes them more likely to consider outlying data that suggest events are unfolding in a way not previously imagined. The challenge for the analyst is to identify just three or four major themes that emerge from the process. The true value of the technique is to provide a palette of ideas from which attention-deserving themes can be developed.

Foresight Quadrant Crunching™ adopts much the same approach as Classic Quadrant Crunching™ but includes the lead scenario in the set of dimensions to be considered. By including the lead scenario, the final set of alternative scenarios provides an analysis that is comprehensive and mutually exclusive. Many of the scenarios generated by this process probably have not been previously considered; on first glance, a few often appear counterintuitive. The difference between the two techniques is Classic Quadrant Crunching™ helps analysts develop a set of credible alternative attack plans to avoid surprise. In Foresight Quadrant Crunching™, analysts engage in a new version of Multiple Scenarios Generation.

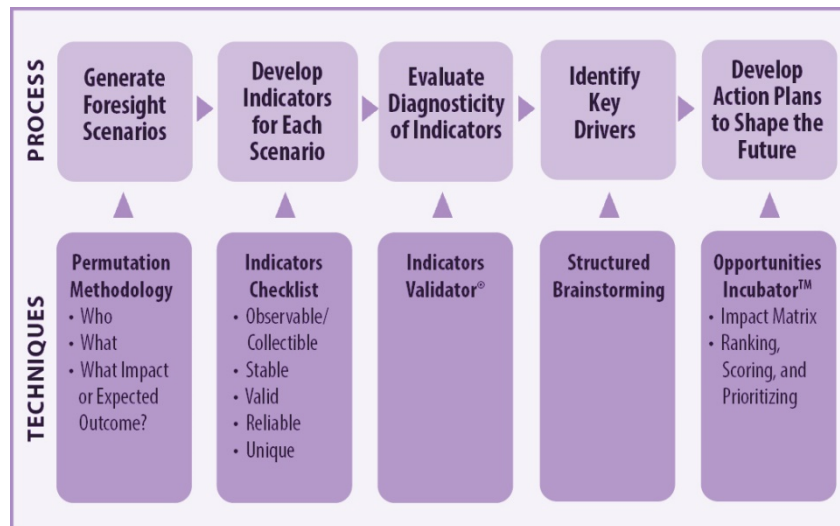
The key steps of the process are: state what most analysts believe is the most likely future scenario; break down this statement into its component parts or key assumptions; posit a contrary assumption for each key assumption; identify one or three contrary dimensions of that contrary assumption; create pairs of contrary assumptions and dimensions and array these pairs in 2 x 2 matrices; and for each cell in each matrix generate one to three credible scenarios.^{ix}

In some cases, the scenarios that result may already have been imagined. In other quadrants, no scenario may make sense. But several of the quadrants will usually stretch the analysts' thinking. Review all the scenarios generated using a pre-established set of criteria and select those scenarios most deserving of attention.

The **Strategic Foresight Decision Tool™** is a five-step process for generating scenarios, developing diagnostic indicators, identifying key drivers, and creating action plans to shape a better future (see Figure 12). The tool provides a structured framework that can support any strategic planning or policy formulation process. It helps decision makers understand the broader context of

an evolving situation and develop specific courses of action to prevent or mitigate untoward developments while helping to foster positive developments. By generating a set of possible outcomes, decision makers can better prepare themselves for what the future might bring, develop specific plans to deal with alternative scenarios, and take proactive steps to optimize the interests of their country or company.

Figure 12. The Strategic Foresight Decision Tool™: A Five-Step Process



Analysts can use the tool to help senior decision makers in government or business:

- Consider a broad range of future outcomes or trajectories.
- Identify the key drivers that underpin each future.
- Recognize events that would signal whether a given future or trajectory is unfolding.
- Develop strategies or action plans to facilitate good outcomes and constrain undesired consequences.

The first step in the process is to develop a set of alternative scenarios through the use of a permutation methodology that generates combinations of Who, What, and with What Impact? Multiple permutations are created and then the analysts select the most credible, attention-deserving alternatives based on a pre-established set of criteria. Once a set of scenarios has been selected, indicators are generated for each scenario and analyzed to establish their diagnosticity. Non-diagnostic indicators are discarded. Having created a set of scenarios with accompanying indicators, the analytic team most likely has acquired sufficient knowledge of the anticipated environment to use Structured

Brainstorming to identify the key drivers that will determine which scenario will eventually unfold.

The last step in the process, the use of the Opportunities Incubator™ is a new structured analytic technique that was developed in 2015 specifically to buttress the Strategic Foresight Analysis process. The Opportunities Incubator™ is a systematic method for identifying actions that can facilitate positive outcomes and thwart or mitigate less desirable outcomes. It is most useful when senior decision makers or corporate executives ask how the future may evolve and see the need to prepare for change or want to shape how that change might occur.

The Opportunities Incubator™ is designed specifically to help senior officials and decision makers identify what actions would be most effective in preventing a negative scenario from occurring or fostering the emergence of a good scenario. The technique focuses attention on who is most affected by a given scenario and who has both the capability and likely intent to influence an outcome. The five-step process also helps analysts escape established mindsets; avoid Confirmation Bias, Groupthink, and Premature Closure; and create warning indicators. The techniques, once learned, are easily integrated into any analytic process and can prevent major intelligence or business strategy failures and extensive postmortems.

The Opportunities Incubator™ should be used after a set of alternative scenarios has been generated to develop a specific action plan tailored to each scenario. The key steps in the process are (see Figure 13):^x

- Describe the scenario in one sentence.
- Determine your customers' or decision makers' policy preference: is this a positive scenario that would serve their interests or a scenario that would damage their interests?
- Identify the primary actors in the scenario and assess the impact of the scenario on each actor.
- Rate how much each actor would care if the scenario came to pass.
- Assess the capability of each actor to respond to the scenario.
- Assess the actors' intentions to shape the scenario.
- Record the key drivers that would most influence the actors or their response.

Figure 13. Opportunities Incubator™ Template

Assessment					Prioritization	Formulation
Primary Actors	Drivers	Impact	Capability	Intent	Priority	Strategy

- Identify the actors that should receive the most attention after taking all the factors discussed above into consideration.
- Develop a list of actions that decision makers can take to influence that actor and best achieve their policy objectives.

Indicators: An Essential Partner

A critical step in ensuring the effectiveness of a Foresight Analysis project is to devote sufficient time after the scenarios have been created to develop—and monitor—a robust set of indicators for each alternative scenario. Identification and monitoring of indicators or signposts can provide early warning of the direction in which the future is heading—a key concern if dealing with a downside national security or corporate risks. The human mind tends to see what it expects to see and to overlook the unexpected. The prior identification of a scenario and the careful tracking of associated indicators can create an awareness that prepares the mind to recognize early signs of significant change.

Indicators are particularly useful in helping overcome Hindsight Bias because they generate objective, pre-established lists that can be used to capture an analyst's actual thought process at an earlier stage of the analysis. Similarly, Indicators can mitigate cognitive biases including the Anchoring Effect and assuming something is inevitable if the indicators that the analyst had expected to emerge are not actually realized.

Good indicators possess five key characteristics: they are observable and collectible, valid, reliable, stable, and unique (see Figure 14).^{xi} The first two characteristics are required for every indicator. The third and fourth characteristics are extremely important but cannot always be satisfied. The fifth characteristic is key to achieving a high degree of diagnosticity for the indicator but is the most difficult goal to reach.

Figure 14. Five Characteristics of a Good Indicator

Key Characteristic	Description
Observable/ Collectible	Can be sensed visually or by other means and accurately reported
Valid	Accurately and reliably captures the phenomenon
Reliable	Is reported consistently by different people
Stable	Remains consistent over time
Unique	Measures only one thing

When developing indicators, clearly define the issue, question, outcome, or hypothesis and then generate a list of activities, events, or other observables that you would expect to see if that issue or outcome emerged. Think in multiple dimensions using STEMPLE (social, technical, economic, military, political, legal, and environmental dimensions) to stimulate new ways of thinking about the problem. Also consider analogous sets of indicators from similar or parallel circumstances. Remember that indicators must be tangibly defined to be

objective and reliable. For example, "growing nervousness" or "intent to do harm" would fail the test, but "number of demonstrators" or "purchase of a weapon" would pass.

Lastly, consider the indicators as a set. Are any indicators redundant? Is the set of indicators comprehensive? Have you generated enough indicators—generally three to ten depending of the uniqueness or diagnosticity of each indicator in the set.

The best way to assess the diagnosticity of indicators used to distinguish between different scenarios is to employ the Indicators Validator® methodology.^{xii} The Indicators Validator® helps ensure the credibility of the analysis by identifying and dismissing non-diagnostic indicators defined as indicators that would be present for multiple scenarios. A highly diagnostic indicator would be present for one scenario but not for any other scenarios. A non-diagnostic indicator would be observed in every scenario. Most indicators fall somewhere in between. The Indicators Validator® methodology helps you identify the most diagnostic indicators for each scenario and identify those indicators most deserving of monitoring and collection.

If you take the time to develop robust sets of indicators for your project, you need to establish a regimen for monitoring and reviewing the indicators on a regular basis. The indicators should be evaluated on a set schedule—every week or every month or every quarter—and based on pre-established criteria. When many or most of the indicators assigned to a given scenario begin to “light up,” this should prompt the analyst to alert the broader analytic community and key decision makers interested in the topic. A good set of indicators will give you advance warning of which scenario is about to emerge and where to concentrate your attention. It can also alert you to unlikely or unanticipated developments in time for decision makers to take appropriate action.

Optimizing the Impact of Foresight Analysis

The best way to ensure an analytic product using a Strategic Foresight technique has impact is to incorporate the Five Best Practices for Conducting Foresight Analysis (see Figure 15):

1. **Define Focal Question.** Take time at the start of the project to define the purpose of the exercise. This can be accomplished in a number of ways by interviewing the sponsor of the exercise, holding a short brainstorming session involving key stakeholders and facilitators, or engaging all the participants in a brainstorming exercise. If all participants are not involved

2. In this initial discussion, the focal question must be reviewed and validated with all participants before employing the chosen Foresight technique.

3. **Adopt Team Process.** Although some techniques can be performed by a stand-alone analyst, Foresight Analysis is always more robust and productive when a team of analysts is involved. Even the simplest of techniques, such as Flipping Assumptions, should involve at least three analysts to protect against well-engrained cognitive traps like Confirmation Bias, Mirror Imaging, the Availability Heuristic, and the Anchoring Effect.

4. **Embrace Diversity.** When designing an exercise, always try to involve as diverse a group of participants as possible. Ideally, the diversity should span several dimensions: functional expertise (social, technical, economic, military, political, legal, environmental, psychological), academic background (e.g., economist, political scientist, anthropologist), and organizational role (analyst, academic, collector, researcher, policymaker, decision maker). Involving a few individuals drawn from professional fields known for their creativity, such as screenwriters, playwrights, or novelists, always adds value to the process.

5. **Involve Decision Makers.** Past experience has shown that substantial benefits accrue when decision makers are directly involved in the process. The more traditional approach of conducting a Foresight Analysis workshop, writing a paper summarizing the results, and sending it to a key decision maker usually has far less impact on the customer. Much of the value of the exercise for decision makers involves the give-and-take of the discussions, the testing (and rejecting) of various options, and the insights gained from exposure to a myriad of divergent views or perspectives. Analysts often contend that policymakers or senior executives will not spare the time to participate in such exercises. Policymakers familiar with the Foresight Analysis process, however, have often surprised the author by quickly agreeing to dedicate half a day of their time to participate in an exercise or even a day or two to immerse themselves in such enterprises. Their willingness is explained by several factors: the opportunity to exchange views with experts, to devote time to reflecting on the fundamentals of the challenges they face, and to “road test” in a non-politically sensitive environment possible new approaches or policies.

Figure 15. Five Best Practices for Conducting Foresight Analysis

1.	Be explicit about the purpose of the exercise
2.	Adopt a team process
3.	Involve a diverse group of participants
4.	Engage the ultimate decision maker directly in the process
5.	Employ a decision support tool at the end of the exercise

6. **Craft an Action Plan.** The purpose of any Foresight Analysis exercise is to inform future decision making. Every Foresight Analysis should include a final step or process to translate what was learned over the course of the exercise into specific actions a policymaker or other decision maker can take to help positive scenarios come to pass and avoid or mitigate the impact of negative scenarios. This step could be as simple as drafting an Action Plan at the end of the exercise. Usually it is more complex, often involving the use of a specific Decision Support technique such as Force Field Analysis or the Opportunities Incubator™.^{xiii} When a group generates multiple scenarios, it must also develop indicators to track which of the alternative scenarios is beginning to emerge and then regularly recheck the lists of indicators. Usually it is incumbent on the analysts to track the indicators periodically and alert the decision maker when a new scenario is starting to emerge or a threshold appears to have been crossed.

ⁱ Peppler, Brett. "Dealing with the Longer Term in Intelligence Practice: The Application of a Foresight Approach," presented to the International Studies Association (ISA) Convention, February 2015, New Orleans, LA, United States.

ⁱⁱ A fuller description of individual and group Brainstorming techniques can be found in Pherson, Randolph H., *Handbook of Analytic Tools and Techniques*, Reston, VA: Pherson Associates, 2016, p. 102.

ⁱⁱⁱ For a more detailed description of the steps involved in conducting an Alternative Futures exercise, see Richards J. Heuer, Jr. and Randolph H. Pherson, *Structured Analytic Techniques for Intelligence Analysis*, 2nd Ed. Washington DC: CQ Press/SAGE Publications, Chapter 6: Scenarios and Indicators, 2015, p. 143.

^{iv} Schwartz, Peter. *The Art of the Long View*, New York, New York: Doubleday, 1996.

^v For a more detailed description of the steps involved in conducting a Simple Scenarios exercise, see Richards J. Heuer, Jr. and Randolph H. Pherson, *Structured Analytic Techniques for Intelligence Analysis*, 2nd Ed. Washington DC: CQ Press/SAGE Publications, Chapter 6: Scenarios and Indicators, 2015, p. 139.

^{vi} For a more detailed description of the steps involved in conducting a Cone of Plausibility exercise, see Richards J. Heuer, Jr. and Randolph H. Pherson, *Structured Analytic Techniques for Intelligence Analysis*, 2nd Ed. Washington DC: CQ Press/SAGE Publications, Chapter 6: Scenarios and Indicators, 2015, p. 141.

^{vii} For a more detailed description of the steps involved in conducting Classic Quadrant Crunching™, see Richards J. Heuer, Jr. and Randolph H. Pherson, *Structured Analytic Techniques for Intelligence Analysis*, 2nd Ed. Washington DC: CQ Press/SAGE Publications, Chapter 5: Idea Generation, 2015, p. 122.

^{viii} For a more detailed description of the steps involved in conducting a Multiple Scenarios Generation workshop, see Richards J. Heuer, Jr. and Randolph H. Pherson, *Structured Analytic Techniques for Intelligence Analysis*, 2nd Ed. Washington DC: CQ Press/SAGE Publications, Chapter 6: Scenarios and Indicators, 2015, p. 144.

^{ix} For a more detailed description of the steps involved in Foresight Quadrant Crunching, see Richards J. Heuer, Jr. and Randolph H. Pherson, *Structured Analytic Techniques for Intelligence Analysis*, 2nd Ed. Washington DC: CQ Press/SAGE Publications, Chapter 6: Scenarios and Indicators, Chapter 5: Idea Generation, 2015, p. 128, and Randolph H. Pherson, *Analytic Tools and Techniques Handbook*, 4th Ed. Reston, VA: Pherson Associates, 2016, p. 39.

^x A fuller description of the Opportunities Incubator™ can be found in the *Indicators Handbook*, Reston, VA: Pherson Associates, LLC, 2016.

^{xi} A fuller description of Indicators, Indicators Validation, and the Indicators Validator® software tool can be found in the *Indicators Handbook*, Reston, VA: Pherson Associates, LLC, 2016.

^{xii} Access to the Indicators Validator® can be obtained by going to www.globalytica.com.

^{xiii} Descriptions of Force Field Analysis and related Decision Support tools can be found in Richards J. Heuer, Jr. and Randolph H. Pherson, *Structured Analytic Techniques for Intelligence Analysis*, 2nd Ed. Washington DC: CQ Press/SAGE Publications, Chapter 11: Decision Support, p. 2015, 289. The Opportunities Incubator™ is described earlier in this paper.