

## Scenarios

Before concluding this chapter, I want to say something more about scenarios, which present forecasts with alternative outcomes rather than a single expectation for the future. I have mentioned them several times, but now I wish to define them and show their advantages as an approach to futuring as well as visioning.

The underlying benefit of scenarios is that they offer multiple views of the future rather than a single forecasted outcome. They reflect the uncertainty that existed at the time they were generated and the uncertainty that lies in the future. They also encourage you to think of alternative actions associated with alternative outcomes. Scenarios lead to contingency planning and flexibility.

Perhaps no other method of futuring has caused as much confusion as scenarios because of variations in definitions of them and the methods of generating them. Virtually every manager may say that he or she understands and uses scenarios, but few really do.<sup>1</sup>

“Scenario” is an Italian word that originated in the theatre. It means an outline or synopsis of a play, movie, TV show, or game. It typically provides an overview of the script that shows the progression of the plot through a sequence of scenes. Choreography of dance is a variation on a scenario. Today, if you were to use the word “scenario” on Broadway or in Hollywood, people would understand you to mean a concept or overview of a dramatic work.

More than any other individual, Herman Kahn transposed scenarios from the theatre to government and corporate planning. While at the RAND Corporation in Santa Monica, CA, during the 1950s, Kahn used scenarios as a method for thinking through alternative military strategies. He formulated scenarios as hypothetical sequences of cause-and-effect steps from a starting point to a conclusion of a military situation, such as a global nuclear war. In some respects, Kahn’s scenarios were conceptual war games. He demonstrated to the US Air Force that there were many different ways to achieve a mission and that some planned missions were not well thought out and might not have the desired outcomes. In the hands of Kahn, scenarios became a way to think about and plan military operations based on well considered expectations. This meaning of the word in the Department of Defense continues today – scenarios are used as hypothetical sequences of military actions to achieve a defined mission in education and training, war gaming and

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1 Stephen M. Millett, “The future of scenarios: challenges and opportunities,” *Strategy & Leadership*, Vol. 31, No. 2, 2003, pp. 16-24; Ron Bradfield, George Wright, George Burt, George Cairns, and Kees Van Der Heijden, “The origins and evolution of scenario techniques in long range business planning,” *Futures*, 37 (2005), pp. 795-812; Peter Bishop, Andy Hines, and Terry Collins, “The current state of scenario development: an overview of techniques,” *Foresight*, Vol. 9, No. 1 (2007), pp. 5-25.

rehearsals, and planning. Others in Washington have picked up on the same word and meaning, so that we hear about energy, economic, and political scenarios as well as military scenarios.<sup>2</sup>

So, one meaning of “scenario” used in the entertainment industry and in government refers to a hypothetical chain of events from a starting to an ending point. It is primarily a planning (visioning) rather than a futuring method, unless the scenario planners and implementers can make their own desired scenarios come true as examples of self-fulfilling prophecies. In the theatrical sense, “scenarios” are highly imaginative and creative in the best traditions of the performing arts; they can be equally imaginative and creative in the performing arts of government.

Kahn provided the link between the military and business worlds. In 1961 he led a team that founded the Hudson Institute at Croton-on-Hudson, up river from New York City. The Hudson Institute used hypothetical scenarios as well as game theory and systems analysis to perform all kinds of projects for both government and corporate clients. Ian Wilson, a corporate planner from nearby General Electric corporate offices in Connecticut, befriended Kahn and talked with him about how scenarios might be applied to the business world. Kahn and Wilson were joined in their conversations by Pierre Wack from the international oil giant Royal Dutch/Shell in London. Both Wilson and Wack decided to initiate scenario projects as an innovative approach to traditional corporate and financial forecasting, which was dominated at the time by quantitative time-series trend projections and wishful thinking. Wilson and Wack, however, changed the meaning of scenarios so that they became alternative sets of future market and business conditions. “Scenarios” thereby became static in the sense that they were alternative outcomes by a designated future date, regardless of any specific and hypothetical sequences of events to reach them. Although conceived as a planning tool, depending upon how they were generated, scenarios could also be used for futuring. In some scenarios, companies might be able to influence future states, but in other scenarios there might be circumstances beyond their control; in corporate scenarios, one might be both proactive and reactive. This new approach to scenarios appealed particularly to Wack, who wanted to change the corporate culture at Shell to introduce more flexibility in planning and operations to deal with any number of possible futures. For Wilson and Wack, the central question for corporate planning shifted from “what do we want to do and what will our future profits be?” to “what are the potential future business environments and what do we need to do to be successful in each one of them?” Wilson’s first

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2 Arguable the most famous example of military planning scenarios appeared in Herman Kahn, *Thinking About the Unthinkable*. New York: Avon Books, 1971 (1962).

scenarios were rolled out at GE in 1971 and Wack with his team produced their first scenarios at Shell a year later.<sup>3</sup>

Wilson assigned expert judgment probabilities to the first GE scenarios, but Wack did not. Wack did not want scenarios to be seen as traditional forecasts; rather, he presented scenarios as an alternative planning method to what he saw as an over-reliance on numerical forecasts. He defined a “forecast” narrowly, as a series of quantitative expectations, and he urged that planning at Shell be more qualitative and flexible than using time series trend projections. The first Shell scenarios provided only two rather extreme views of the future environment for the oil industry projected out to the year 2000. These two scenarios provided the structure for a conversation of possible scenarios between the two extremes. Wack emphasized the importance of the stories in order to make impressions upon the mental models of Shell executives. He also wanted to discuss the potential discontinuities that he felt intuitively were lying in wait to ambush Shell in the future. Like military planning, Wack wanted to prepare Shell’s management to deal with potential disruptive events before rather than after they occurred.

In 1973, just a year or so after Wack’s team presented their first scenarios at Shell, came the so-called Energy Crisis. The OPEC countries placed an embargo on their oil exports, resulting in the global price of a barrel of crude jumping about four-fold. The oil industry was turned upside down and many companies had no idea what to do in times when old business models failed. Wack proved to be extraordinarily prescient and Shell demonstrated that it was better prepared to deal with the new situation than most other global oil players. As it was told to me by Shell scenario planners in the 1980s, the traditional business model at Shell had been to sell oil products principally at the retail (downstream) level, but the scenarios prepared Shell managers to sell oil at several different points of the upstream and downstream spectrum, making money at the points where profit could be maximized due to volatile market prices.

Shell has continued to generate scenarios since the early 1970s. Their approach to scenario writing evolved over time and spread to other corporations around

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3 Much of the anecdotal history of the origins of corporate scenarios was told to me in telephone conversations and e-mail exchanges with Ian Wilson. I did not have the pleasure of meeting Pierre Wack, but I met his principal associate Ted Newland, who told me that the Shell scenario method was so grounded in the particulars of the international oil business that he had a hard time seeing the application of scenarios for other industries. For Wilson’s pioneering scenario report, see Environmental Task Force of the Corporate Executive Staff, General Electric, “Four Alternative World/U.S. Scenarios 1971-1980,” January 21, 1971; Ian Wilson, “Scenarios,” in Jib Fowles, ed, *Handbook of Futures Research*, pp. 225-247; Pierre Wack, “Scenarios: Uncharted Waters Ahead,” *Harvard Business Review*, September-October 1985, pp. 73-89, and “Scenarios: Shooting the Rapids,” *Harvard Business Review*, November-December 1985, pp. 130-150.

the world. Because their scenarios were closely linked with energy, some Shell scenario practitioners questioned whether or not the method might be valid for other topics in other realms, both corporate and public. It turned out that the method proved useful regardless of the topic. The success of scenarios as a futuring or visioning method depended more upon corporate culture and leadership than the topic or the industry.

Arguably the most famous alumnus of the Shell scenario shop has been Peter Schwartz, who came to Shell from the Stanford Research Institute (SRI) International. Shell used experts from SRI to supplement their own relatively small staff of scenario planners. One of them was Ian Wilson, who left GE on the East Coast to join SRI in the San Francisco Bay area. I have been told at various times that the scenario method originated at Shell and transferred to SRI and that it began at SRI and transferred to Shell. Either way, the scenario method became entrenched at Shell and became a consulting business at SRI. Schwartz was a veteran of both companies, and he and his closest associates created their own scenario consulting firm called Global Business Network (GBN). Their scenario method evolved and procreated many scenario offspring over the years. There are now dozens of scenario methods. Today we call the Shell/SRI/GBN family of scenario methods the “intuitive” scenario approach or “scenario writing.”

There were several similarities but also marked differences between the GE and the Shell scenarios of the 1970s. Both contained alternative portraits of the future rather than hypothetical sequences of events. Both contained extensive amounts of trend analysis – of many different trends beyond familiar products, markets, and customers. Both contained heavy doses of expert judgment, largely that of the scenario team. Both the GE and Shell scenarios were heavily qualitative in their descriptions of the future, which was given as 10 years (to 1980) by the GE scenario team and 30 years (to 2000) by the Shell scenario writers. A significant difference, however, was that GE considered four comprehensive alternative futures, while Shell generated only two, which were the two extreme ends of a spectrum of possible (not likely) scenarios. In later years, the Shell/SRI/GBN scenario method called for four primary, more nuanced, scenarios, and with spinoff scenarios as variations of the principal four. More significant than other differences in style, the GE scenarios included probabilities of occurrence and the Shell scenarios did not.

The use of probabilities with scenarios has been controversial for decades. It is the principal difference between scenarios as qualitative forecasts and scenarios as conjectural planning. Wack was strongly opposed to using probabilities with scenarios in the context of the Shell corporate culture. He felt that as soon as his team expressed the weighting of one scenario over another, management would gravitate to the single, most likely scenario and ignore other possibilities. His goal was to open up, not channel, corporate strategic thinking. He further wanted

to differentiate clearly the difference of scenarios as descriptions of alternative futures versus single point quantitative forecasting. Wack and his successors have consistently argued that scenarios are a way to do planning and not forecasting. He even allegedly denounced modeling as “an enemy to thinking.” The GBN associates have persistently said that “you cannot predict the future” and that all scenarios that are plausible are equal in consideration, with none designated as more likely to occur than others. Wilson, having used probabilities in the first GE scenario project, stopped using them when he went to SRI International.<sup>4</sup>

For many practitioners, the intuitive scenario method developed by Shell, SRI International, and GBN is the only scenario method for corporate planning that has ever existed. They continue to ignore the earlier contributions of Wilson and GE or any of the alternative methods developed at the Futures Group, the University of Southern California (USC), and Battelle. The intuitive scenario approach has many attractive features: it is non-proprietary and open to anyone to do; it can be taught to students and professionals in futuring, strategic planning, and group facilitation; it requires no particular equipment, props, or computers; it is highly adaptable to particular circumstances; it can be applied to virtually any topic and any participants; and it does not claim to be predictive, only provocative in stimulating people’s thinking about future possible environments. Not to be underrated, scenario exercises are supposed to be entertaining with the participants getting very enthusiastic about their work.

The intuitive scenario method as practiced today has countless variations ranging from very casual to rather complex. Typically, there will be a facilitator, a few experts, and a selected group of people from the company or organization that is hosting the scenarios exercise. Participants today are not nearly as well prepared in the trends as the original Shell scenario writers were. In many cases, the social experience of generating scenarios is of more importance than the scenario content because the participants are learning to work together in exchanging ideas and realizing possibilities. They may be the same people who have to work together to make things happen in the future.

The scenarios are typically generated in a workshop setting. The workshop might be just a half-day, one full day, the better part of two days, or spread out at selected intervals over several weeks. The method usually consists of the following steps:

1. Compose a topic or focus question for the scenarios that has meaning for the hosting company or organization. This may be achieved by the team leader and the corresponding executive or it may be done collectively with the participating group.

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<sup>4</sup> Stephen M. Millett, “Should Probabilities Be Used With Scenarios?,” *Journal of Futures Studies*, Vol. 13, No. 4 (May 2009), pp. 61-68.

2. Generate a list of the most important trends, issues, and factors relative to the topic question (usually with a voting procedure to converge on a selected few). This is typically achieved with one of several techniques for managing group dynamics, such as Idea Generation, Brainstorming, the Nominal Group Technique, etc.
3. Reach group consensus on just two trends, issues, or factors from the list generated above that are viewed as being *both* the most important *and* the most uncertain in the future. For example, the two might be US GDP growth rates and Achievement in US Education. Of course, terms should be defined as carefully as possible.
4. Structure the scenarios based upon the two most important and uncertain trends, issues, or factors, which are arrayed orthogonally to each other as axes of a symmetrical matrix with four sectors, or quadrants. Each axis is viewed as a continuum from one extreme (such as “low” or “negative”) to the other (such as “high” or “positive”). This becomes the structure for writing four scenarios relative to each of the quadrants created by the axes. Each template corresponds to the four quadrants: “low, low,” and “low, high” and “high, high” and “high, low.”
5. Generate stories, or scenarios, for each quadrant. This can be done collectively or by sub-groups with one scenario for each sub-group. The stories are generated in an intuitive way with a heavy emphasis on imagination. These scenarios are descriptions of a future environment that incorporates as many story elements (including other trends, issues, and factors) as possible.
6. Discuss business implications and potential strategies and plans for each of the scenarios, whether probabilities are used or not.<sup>5</sup>

When I facilitate this type of intuitive scenario generating exercise, I begin with the orientation of futuring, with the topic question focused on some major aspect of the market or operational environment of the participants. Steps 1-5 should stay centered on that environment and not introduce, yet, the desires of the participants. Then Step 6 becomes an exercise in visioning within the context of having done the preceding futuring. This approach tries to maximize “objectivity” and minimize the dangers of context-free, wishful thinking.

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5 The Shell/SRI International/GBN scenario method has been described in dozens of articles and books. One of the earlier accounts is Peter Schwartz, *The Art of the Long View*. New York: Currency/Doubleday, 1996 (1991), pp. 227-248. I recommend Bill Ralston and Ian Wilson, *The Scenario Planning Handbook. Developing Scenarios in Uncertain Times*. Mason, OH: Thomson South-Western, 2006.

The intuitive scenario method places a heavy emphasis on the intuitive qualities of the participants. One might argue that the intuitive scenario method places a heavy emphasis on the expert judgments of the scenario-generating team. Some participants may be very knowledgeable about trends and well prepared to create scenarios, but others may not. It has even been argued that the emotions of the participants and their commitments to the scenarios and their business implications are far more important than the cerebral quality of the scenarios. Maybe, but I prefer high quality scenarios from which we can derive well considered expectations for the future.

Whether a scenario is “good” or “bad,” or “best case” or “worse case,” is purely a matter of perspective. They are “good” or “bad” relative to biases and wishes. The reality is that in every economic or market situation, somebody makes money while others get hurt. The proactive challenge is to recognize emerging conditions and position yourself to maximize what opportunities there are to make money and to minimize the threat of losing money.

Scenarios can be predictive within the boundary conditions of trend momentum, cause-and-effect relationships, closed system or fixed set, and self-fulfilling prophecy. They can also provide foresights from the visioning perspective, which is why people often call them a “scenario planning tool.”

There is a more rigorous and analytical approach to generating scenarios than the Shell method that relatively few practitioners know. Analytical scenarios can be generated by using cross-impact analysis, modeling, and simulation, usually but not necessarily with the help of computer software tools.

The creation of cross-impact analysis as an alternative to the intuitive method of generating scenarios is credited to a group of highly innovative analysts at the RAND Corporation in the late 1950s and early 1960s. Two of them in particular, Olaf Helmer and Theodore Gordon, developed cross-impact analysis to generate multiple forecasts (alternative futures or scenarios) as an alternative to Kahn’s hypothetical, sequential planning scenarios. Helmer left RAND to go to USC, where he and his academic team created a scenario method called INTERAX. Gordon left RAND to organize his own company, the Futures Group, in Connecticut. His team developed a variation of cross-impact analysis and scenario generation, also with the use of a computer, that they called Trend Impact Analysis. Their approach migrated to the consulting practice of Deloitte. Gordon himself moved on in later years to the Millennium Project of the World Federation of UN Associations.<sup>6</sup>

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6 William R. Huss and Edward J. Honton, “Scenario Planning – What Style Should You Use?,” *Long Range Planning*, Vol. 20, No. 4 (1987), pp. 21-29; Millett, “The Future of Scenarios;” conversation and subsequent e-mails with Jerome C. Glenn, Director, The Millennium Project, September 2008.

Selwyn Enzer, a colleague of Helmer at USC, was the principal agent of the INTERAX technology transfer to the Battelle Memorial Institute in the 1970s. He worked with Battelle mathematicians and computer technologists at Geneva, Switzerland, to develop the algorithms of calculating Bayesian probabilities and cross-impact values. The Battelle approach differed from other cross-impact and scenario methods in that it identified alternative outcomes, each with its own *a priori* probability, for each alternative state of each descriptor (as opposed to just one outcome for each descriptor) and its algorithm was deterministic, not Monte Carlo, in the sense that it did not use random number generators and adjusted the *a priori* probabilities up and down according to the cross-impact values in always the same way. This approach allowed simulations where the analysts knew that changes in outputs were due to changes in inputs and not to variations in Monte Carlo number sequences. In addition, the Battelle Frankfurt laboratory provided the method for employing group dynamics, or expert focus groups, to determine the most important trends, issues, and factors (called “descriptors”) to be used in the scenario analysis. The Columbus laboratory provided the systems integration, packaging, and marketing. The Battelle method was called BASICS (Battelle Scenario Inputs to Corporate Strategy) and was rolled out publicly in 1980. In the mid-1980s the Columbus laboratory developed the first personal computer version of the software program, called BASICS-PC. About a decade later, it reprogrammed the software for Windows and changed the name to Interactive Future Simulations (IFS)<sup>TM</sup> It used the analytical modeling approach with its various computer software programs as both a forecasting and a planning method for over 100 corporate and government clients around the world.<sup>7</sup>

While there are some important similarities, particularly at the beginning and the ending of the processes, between analytical and intuitive scenarios, there are some very important differences, especially in the procedure used to generate the scenarios. A typical analytical scenario project consists of the following steps:

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7 I practiced the BASICS method as a manager and consultant with Battelle from 1983 to 2006. I knew and worked closely with several of the developers of BASICS, the BASICS-PC, and IFS. I continue to consult through my own company, Futuring Associates LLC. For documentation of the Battelle approach to scenarios, see A. Duval, E. Fontela and A. Gabus, “Cross-Impact Analysis: A Handbook on Concepts and Applications,” in Maynard M. Baldwin, ed., *Portraits of Complexity. Applications of Systems Methodologies to Societal Problems* (Columbus, OH: Battelle Memorial Institute, 1975), pp. 202-222; Huss and Honton, “Scenario Planning – What Style Should You Use?; E. J. Honton, G. S. Stacey, and S. M. Millett, “FUTURE SCENARIOS: The BASICS Computational Method” (Columbus, OH: Battelle Columbus Division, October 1984, Revised July 1985); Stephen M. Millett and Edward J. Honton, *A Manager’s Guide to Technology Forecasting and Strategy Analysis Methods*. Columbus, OH: Battelle, 1991, pp. 63-75; Stephen M. Millett, “Interactive Futures Simulation (IFS)<sup>TM</sup> Theory and Computational Method, December 16, 2008, on the website of Futuring Associates LLC: [www.futuringassociates.com/thoughts.html](http://www.futuringassociates.com/thoughts.html)



1. Formulate a topic question that has practical value for the hosting company or organization in much the same way that it is done in the intuitive scenario method.
2. Generate a list of the potentially most important descriptors (trends, issues, and factors) relevant to the topic question. Vote, consolidate, and select as many as 20 descriptors (with 12-16 descriptors usually optimal).
3. Research and prepare a white paper on each descriptor that includes definitions, importance, trends, current conditions, alternative outcomes, and *a priori* probabilities of occurrence for each of the alternative outcomes for each descriptor (summing to 1.0). These descriptor white papers support the judgments that will be made in the cross-impact analysis of the descriptors. They also provide a library that can be shared widely and periodically updated with new information that comes from trend monitoring.
4. Create the cross-impact matrix and perform the cross-impact analysis with or without a laptop software tool.
5. Generate scenarios (alternative sets of concurrently occurring descriptor states) and consolidate and select about five for further analysis.
6. Perform simulations with variations in *a priori* probabilities and cross-impact values and the introduction of hypothetical disruptive events (or black swans).
7. Discussion of the business implications and potentially effective strategies for each of the five principal scenarios.

The analysis of business implications is extremely important for scenarios. If you had only the scenarios, what would you do with them? You might see alternative future outcomes, but so what? You have to also derive specific opportunities and threats from each scenario. You have to build the bridge of scenario implications analysis to connect futuring with visioning in order to get to planning.<sup>8</sup>

The Shell/SRI International/GBN school of intuitive scenario writing stresses that a company or organization must develop strategies and plans based on each of the scenarios. Using that method, there would be four sets of strategies and plans based on four different scenarios. Wack's original intent was to force managers

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<sup>8</sup> Stephen M. Millett, "How Scenarios Trigger Strategic Thinking," *Long Range Planning*, Vol. 21, No. 5 (1988), pp. 61-68; Michael E. Raynor, *The Strategy Paradox*. New York: Currency/Doubleday, 2007, especially pp. 177-230. Raynor argues for probabilistic scenarios as an input to the calculations of real options analysis.

to draw up multiple business plans, not just contingencies from one primary plan. In this regard, Wack was trying to do with business people what Kahn had shown to Air Force generals. But I rarely got my corporate managers and clients to go that far. It involves too much effort, time, and expense. The best that I could realize was the analysis of implications for each scenario and then the clustering of implications into one or two particularly robust strategies that would be a response to several scenarios.

Of course, no forecast is ever complete and requires continual monitoring and revision, as discussed in previous chapters. At this point, we should transition from futuring to visioning to pick up the elements of planning, which is the conjunction of futuring and visioning.