

The Case Study Approach to Scenario Planning

A. Gregory Stone
Regent University

Timothy A. O. Redmer
Regent University

Scenario planning is a strategic planning method that organizations use to develop flexible long-term plans. The authors, experienced in case study design, development, and method for teaching in an MBA program, used the case study approach to create a scenario planning strategy to analyze a company's product and move the company through its decision-making dilemmas. The case study is a technique well-suited for gathering and organizing the data and information required to construct the scenario. It can capture data and information related to past business performance, decisions, and dilemmas so the executive staff and other key employees can explore the future and the product/market options and possibilities using the scenario-planning process.

“Houses are blowing away in hurricanes, and I have the product to literally ‘change the landscape,’” lamented David. David Pace, owner of Cellox, LLC, was contemplating this dilemma when the authors met with him as consultants. “The third pig of the three little pigs had good reason to build his house out of brick and mortar as opposed to his brothers, who made their houses of sticks and straw,” he quickly added. David owns a patented insulated concrete form (ICF) product for the home construction market. It is notably superior to his competitors, but his difficulty was in persuading customers to change from stick construction to his concrete-based product.

“Practical pig knew he would face the wind of the Big Bad Wolf some day, so he wanted to build things right!” Then the Big Bad Wolves—Katrina, Rita, and Wilma—assailed the Gulf Coast states and blew the stick homes down. David was right, but his company was manufacturing ICFs in Wisconsin—over 1,000 miles away from his primary market in the hurricane-stricken south.

The authors, experienced in case study design, development, and method for teaching in an MBA program, implemented a plan to analyze the future of David's product using a scenario-planning strategy to move the company through its decision-making dilemma. The case study was used to capture data and information related to past business performance, decisions, and dilemmas so that David, his executive staff, and other key employees could explore the future and the product/market options and possibilities using the scenario-planning process.

Scenario Planning

Scenario planning is a strategic planning method that organizations use to develop flexible long-term plans. The method requires a group of analysts to generate strategy options for policy or decision makers. They first find known data and information from the past and present, such as customer demographics, product sales history, industry information, and competitor information, etc. Then, they combine this with specific and detailed future-oriented possible, probable, estimated, or projected data and information about product(s), service(s), social trends, industry trends, technical or technology trends, market trends, or other changing, evolving, unknown, or speculative data.

A scenario is a narrative description of the future that focuses attention on causal processes and decision points (Kahn & Wiener, 1967). They are used in long-range planning and the development of robust plans and encompass a broad span of future possibilities so the future can be met with some degree of confidence. No scenario is ever seen as absolute, as the probability of any scenario being realized is inconceivably small. It is not accuracy that is the measure of a good scenario, but that the scenario is (a) plausible (it tells the story about getting from here to there in a rational fashion), (b) internally self-consistent, and (c) useful in decision making.

Scenario planning often includes elements that are difficult to formalize, such as subjective interpretations of facts, shifts in values, new regulations, or inventions (new technologies). The scenarios usually include plausible, unexpectedly important situations and problems that already exist in some small form in the present day. Good consultant analysts select informational features that are both possible and uncomfortable so that decision makers anticipate hidden weaknesses and inflexibilities in structures, processes, and methods.

Scenarios are currently more a practitioner's art than a rigorous academic field, and they provide an intuitive approach to understanding the business environment. They can be either exploratory or normative; that is, they can produce images of expected futures or desired futures. Exploratory forecasts portray futures that seem plausible, given actions or inactions of key players, exogenous developments, chance, and the internal dynamics of the system under study. Exploratory forecasts respond to the question: What do you think the future might be?

Normative forecasts describe what is hoped for in the future; these forecasts also can be produced with either qualitative or quantitative methods. Normative forecasts respond to the question: What kind of future would you like to see?

Scenarios, like games and simulations, are most commonly operated hundreds of times faster than real life, so decision makers can experience several years of decisions along with their effects and impacts in less than a day. Good consultant analysts design the scenarios so decision makers have the flexibility and freedom to adapt their simulated organizations. Then these simulated organizations are "stressed" by the scenarios as a game plays out. Usually, particular groups of facts become more clearly important so the organization can refine and repackage real information more precisely to better serve the decision makers' real-life needs.

For example, a scenario may help David discover that he needs to change his marketing strategy or use cash reserves to purchase equipment in anticipation of increased production demand. When uncovered in advance, such opportunities can be addressed or possible threats reduced or eliminated. Dilemmas and difficulties are managed more easily and more correctly than if the real problem or issue appeared as a crisis.

A challenge of scenario planning is to determine the real needs of corporate leaders and managers. Oftentimes, they may not know what they need to know, or may not know how to describe the information that they really want. A value of scenario planning is that leaders can make mistakes and learn from mistakes without risking important and costly failures in real life. They can make these mistakes in a pleasant, unthreatening, game-like environment, while responding to a wide variety of concretely presented scenarios based on facts.

Origins of Scenario Planning

Scenario planning has primarily been used in the military. Business, however, has had the naive notion that all you had to do to solve a problem was get people together, let them discuss and solve problems, and everything will be great. Many of the proposed solutions, however, were outside the scope of the management team, and teams were misled into thinking that their solutions would be implemented. Management teams of this type were “catching on” in the late 1980s and early 1990s, but there was frustration because few “results” (benefit to the all-important bottom-line) were being seen in the quality improvement initiatives.

According to Harrington (1991), managers were “working on the wrong part of the business” (p. x). The production process for “an average product accounts for less than ten percent of the product value” (p. x) in manufacturing and does not even exist in the service industry. “As a result, business processes became the major cost factor” (p. x) in American companies. Improvement in the businesses processes area required a new strategy. This has evolved into what is seen today as scenarios.

Training, collaboration (Finnigan & Schmidt, 1992), and problem-solving techniques (Nuese, 1995) were, in Harrington’s (1991) words, “an investment in the future of the company” (p. 250). “Businesses are too complex, and the difference between success and failure too small, to continue to fly by ‘the seat of our pants’” (p. 250) for decisions to be made without the use of statistical expertise.

Using the Case Study to Create Scenarios

Case studies have been widely used in academia as a teaching pedagogy for many years. Led by the Harvard School of Business, many educational institutions find the case study method of teaching to be a logical way to sharpen critical thinking skills. The case study serves as a practical application of the theoretical and conceptual topics introduced in the classroom environment.

A case is a story. Cases recount—as objectively and meticulously as possible—real (or realistic) events or problems so that students experience the complexities, ambiguities, and uncertainties confronted by the original decision makers in the case. As they involve themselves in a case, students must ferret out key factual components from the real messiness of contradictory and complicated information. Cases compel students to (a) distinguish pertinent from peripheral information, (b) identify the problem(s) at hand and define its context and parameters, (c) identify a set (or sets) of possible solutions, (d) formulate strategies and recommendations for action, and (e) make decisions and confront obstacles to implementation.

Case teaching anchors academic instruction in reality by engaging students in discussion of specific situations. Case teaching is learner-centered, characterized by intense interaction between instructor and student as well as among students in a group. Conceptually, case teaching

assumes that learning is more effective if students discover or construct knowledge with the instructor's guidance, rather than if they sit passively and receive content from a distant "sage on the stage." Just as a child learns to ride a bike by getting on it, students in a case-based course actively engage course material. They simultaneously learn curricular content (knowledge) and how to develop skills and competencies such as writing, speaking, listening, and critical thinking.

Case learning depends on inductive reasoning, making content the very foundation of a case course. Case learning sharpens communication and critical thinking skills as students apply knowledge and evaluate options to solve the problem at hand. Case discussions teach students to listen carefully to each other, to respect opinions of others, and to work collectively to solve a problem. Thus, students learn to value the contributions of others while strengthening their own ability to think creatively and communicate effectively.

According to Harvard University, when students are presented with a case, they place themselves in the role of the decision maker as they read through the situation and identify the problem they are faced with. The next step is to perform the necessary analysis—examining the causes and considering alternative courses of action—to come to a set of recommendations for what needs to be done to impact the future (How the case method works, n.d.).

In a consulting context, case studies can work in a reverse fashion. The decision has already been made. Entrepreneurs are often very familiar with the important issues, but they can benefit from the structure a case study brings to the table with its association to proven theoretical concepts and analysis methods. At the very least, the case study can help management better understand important facets of the critical thinking process such as recognizing decision points and key issues that impact a decision.

The case can be a strategic "future-oriented" tool for capturing data and information for scenario planning. The case (a) identifies a decision dilemma, (b) illustrates issues and factors typical of the kind of problem under examination, (c) reflects disciplinary concepts and analysis, (d) considers the impact on various stakeholders, and (e) reveals realistic complexities and tensions.

At Cellox, a case study was initially developed that considered a fixed asset acquisition needed to meet anticipated increases in production. Management was able to reconfirm a decision point. An important part of the activity was identifying critical issues and variables such as available financial resources and anticipated cash flows, capacity levels, various production and sales constraints, and human resource responses. The complexity of the situation became evident and management, along with the assistance of the consultants, was introduced to various forms of analysis and decision models to aid in the problem-solving process. The case study scenario, itself, did not change the already determined outcome; however, it did help to get key management people comfortable with the scenario-planning strategy.

Case Study Scenario Planning

With a case study focusing on a past event and scenario planning focusing on the future, it appears incongruous that they could work in tandem in a consulting framework. Case studies and scenario planning actually share some important commonalities that can contribute to the success of decision makers who are planning for the future.

Shared Attributes between Case Study and Scenario Planning

The following are some shared attributes:

1. Clear and beneficial project goals (Archibald, 1992; Brinkerhoff, 1998; Furland, 1995; Galpin, 1996; Harrington 1991; McGregor, 1960; Nuese, 1995; Parker, 1990; Scholtes, 1988; Silber & Smith, 1994). Case studies and scenarios both start with well-defined goals and objectives.
2. Empowerment (Champy, 1995; Clemmer, 1992; Finnigan & Schmidt, 1992; Nuese, 1995; D. K. Smith, 1996; P. L. Smith, 1991). Case study teaching traditionally empowers students to actively participate in the discussion and decision-making process. Scenarios empower managers and decision makers to interact with causal elements and make “mistakes” in a risk-free environment.
3. Motivation (Archibald, 1992; Armstrong, 1994; Finnigan & Schmidt, 1992; Parker 1990). Case studies and scenarios motivate participants to be creative, stretch their capabilities, and positively address uncomfortable issues.
4. Active leadership and participation of management (Scholtes, 1988; D. K. Smith, 1996). Case studies and scenarios involve all the players in the activities.
5. Visible management recognition (Finnigan & Schmidt, 1992; Galpin, 1996; Gupta, 1994; Klubnick, 1995; Nuese, 1995; Parker, 1990). Both processes inherently reinforce decision making, participation, and team interaction.
6. Visible management support (Galpin, 1996; Harrington, 1991; Nuese, 1995; Parker, 1990). Case studies are supported by faculty and the university administration, while scenarios occur with the tacit support of key leadership.
7. Representation of all process-impacted systems (Furland, 1995; Galpin, 1996; Harrington, 1991; Peters & Waterman, 1982; Scholtes, 1988; Silber & Smith, 1994; D. K. Smith, 1996; P. L. Smith, 1991). Case studies include this data and information, while scenarios incorporate them during the development phase.
8. Team training and experience in team dynamics (Finnigan & Schmidt, 1992; Galpin, 1996; Gupta, 1994; Harrington, 1991; Nuese, 1995; Scholtes, 1988). Case study discussion occurs in a dynamic, moving, flowing, and ever-changing environment, as do scenarios.
9. Access to appropriate technical expertise. Faculty members fulfill this role for case studies; likewise, consultants/analysts fulfill this role for scenarios.

The case study captures the critical background information essential for the foundational work of scenario-planning activities. In the case of Cellox, it provided the framework in which to incorporate past corporate activities and events to identify the structures, processes, and systems necessary to create the “next logical step” out into future decision-making scenarios facing the company.

Parallel Steps between Case Study and Scenario Planning

The case study development process parallels the early steps in the scenario-planning process:

1. Dilemma and Key Question
Case Study - Determine the dilemma or decision-making situation.

- Scenario Planning - Decide on the key question to be answered by the analysis. By doing this, it is possible to assess whether scenario planning is preferred over the other methods.
2. Analysis Determination
Case Study - Determine the analysis that will be required by learners (most often students) to identify and address relevant issues.
Scenario Planning - Set the time and scope of the analysis. Consider how quickly changes have happened in the past and try to assess to what degree it is possible to predict common trends in demographics, product life cycles, etc.
 3. Stakeholders
Case Study - Identify major stakeholders who would be impacted by the decision.
Scenario Planning - Identify major stakeholders. Decide who will be affected and has an interest in the possible outcomes. Identify their current interests and whether and why these interests have changed over time in the past.
 4. Data, Trends, and Driving Forces
Case Study - The case generally relies only on data included in the study for analysis purposes.
Scenario Planning - Map basic trends and driving forces. This includes industry, economic, political, technological, legal, and societal trends. Assess to what degree these trends will affect your research question. In this step of the process, brainstorming is commonly used, where all trends that can be thought of are presented before they are assessed.

At this point, the case study has collected the historical data and information, and the scenario-planning process starts cultivating data and information that will project into the future based on several development characteristics.

Scenario Planning Development Characteristics

1. Scenario Planning - Find key uncertainties. Map the driving forces on two axes, assessing each force on an uncertain/predictable and important/unimportant scale. All driving forces that are considered unimportant are discarded. Important driving forces that are relatively predictable (e.g., demographics) can be included in any scenario, so the scenarios should not be based on these. This leaves you with a number of important and unpredictable driving forces.
2. Scenario Planning - Check for the possibility to group the linked forces and, if possible, reduce the forces to the *two* most important (to allow the scenarios to be presented in a neat xy-diagram).
3. Scenario Planning - Identify the extremes of the possible outcomes of the (two) driving forces and check the dimensions for consistency and plausibility. Three key points should be assessed: (a) Time frame: Are the trends compatible within the time frame in question? (b) Internal consistency: Do the forces describe uncertainties that can construct probable scenarios? (c) Stakeholders: Are any stakeholders currently in disequilibrium compared to their preferred situation, and will this change the scenario? Is it possible to create probable scenarios when considering the stakeholders?

4. Scenario Planning - Define the scenarios, plotting them on a grid if possible. Usually, two to four scenarios are constructed. One approach can be to group all positive elements into one scenario and all negative elements (relative to the current situation) in another scenario, then refining these. In the end, try to avoid pure best-case and worst-case scenarios.
5. Scenario Planning - Write out the scenarios. Narrate what has happened and what the reasons can be for the proposed situation. Try to include good reasons *why* the changes have occurred. Finally, give each scenario a descriptive (and catchy) name to ease later reference.
6. Scenario Planning - Assess the scenarios. Are they relevant for the goal? Are they internally consistent? Are they archetypical? Do they represent relatively stable outcome situations?
7. Scenario Planning - Identify research needs. Based on the scenarios, assess where more information is needed. Where needed, obtain more information on the motivations of stakeholders, possible innovations that may occur in the industry, etc.
8. Scenario Planning - Develop quantitative methods. If possible, develop models to help quantify consequences of the various scenarios, such as growth rate, cash flow, etc. This step does, of course, require a significant amount of work compared to the others and may be left out in informal or unplanned analyses.
9. Scenario Planning - Converge toward decision scenarios. Retrace the steps above in an iterative process until you reach scenarios that address the fundamental issues facing the organization. Try to assess upsides and downsides of the possible scenarios.

The authors formed the relationship with David's company based on developing a case study. This method provided access to corporate data and information and was not confrontational. It gave the authors an open door with key decision makers and managers who felt comfortable in discussing their role, processes, and interactions. Consequently, they actively participated in the assessment and analysis. They understood there were no "correct answers" in the case study, thereby allowing employees to be willing to express facts, introduce key relationship details, and share critical variables imperative to the decision process. This exchange created an environment of trust between the consultants and company employees. They gave a historical account of decision circumstances and focused on fixing the problems, not fixing the blame.

The case study professor, scenario analyst planner, and consultant all resemble an orchestra conductor. Much as a conductor creates music by coordinating individual performances, providing key signals, and knowing what the outcome should sound like, a case study professor/scenario-planning consultant generates learning by eliciting individual observations and analyses, asking key questions, and knowing what learning outcomes he or she wants students/managers to achieve. In a like manner, the conductor cannot make orchestral music alone, and the case study professor/scenario planner does not generate future options alone; each depends on individuals, as well as collective performances, coordinated to explore stated options.

One consultant compared case teaching and scenario planning to attempting to assemble a group of parachutists at a single location after they had all landed at different locations. Initially, individual students and business managers are likely to notice different ideas or details in a case or scenario. One of the tasks of the professor/consultant is to orchestrate

students'/managers' observations so they will eventually come to comprehend the larger goals for the case/scenario and comprehend the potential options and outcomes in the future.

Applying the Case Study Scenario Planning Strategy at Cellox

David Pace faced some major challenges in manufacturing, marketing, selling, and distributing his product. These processes were complicated by a construction industry generally resistant to change, even though traditional home construction methods could not withstand the damage inflicted by recent hurricanes.

The authors canvassed the company for recent decision situations that could lead to the development of case studies for academic use, such as the fixed asset acquisition discussed earlier. Employees were very willing to share experiences from the past from an “assessment” perspective, as several financial and marketing related circumstances soon surfaced, any one of which was the basis for an individual case study.

This exchange of thoughts and ideas toward a case study served as an “ice breaker” between the consulting authors and key employees, and the discussions were never viewed as threatening. In addition to gathering key information about the company, its products, and systems, equally important information was gleaned from the employees about their own roles, qualifications, training, skill sets, personal strengths and weaknesses, and the interpersonal relationships that laid the groundwork for scenario-planning activities and the exploration of their corporate future.

Drawing out information about past events for the case study helped the employees recognize and understand the importance of their company's key decision points and how those decisions had to be shaped and defined. They also realized the importance of identifying underlying issues and variables that influence and impact current decisions, thereby locking in certain paths and policies for the future—right or wrong. They began to see that their decisions went far beyond their immediate environment, and a variety of stakeholders were usually impacted (directly or indirectly) by a specific decision process.

The specific area of past marketing activities for the company was especially revealing. Through discussions with management, it became evident that they first needed to distinguish between the meaning of sales and marketing. David's desire to get the industry and customers to recognize the value of his product was going to eventually require a two-pronged approach: one focused on sales with customer contacts and training, and a second focused on marketing by convincing the general public and industry that David produced a must-have superior product. A marketing-oriented case study that looked at the marketing initiative of the company in the past was developed. This process opened executives' eyes in an unthreatening way and gave them motivation to immediately begin developing future-oriented scenarios.

After creating these past-experience case studies, the process of basing the future alternatives and dilemmas on solid corporate precedence was fairly routine. There was a natural progression of activities and events that was “in sync” with logical business operations. The past became the logical reference point for identifying the key factors for the future scenario planning.

Conclusion

The authors implemented this case study scenario planning strategy by enabling Cellox decision makers and managers to discover things for themselves, rather than doing the work for them. Managers became reflective practitioners with access to appropriate information. Not only did Cellox executives have to deal with their Wisconsin location and a reluctant construction industry, but the scenario planning strategy helped them to carve through these future issues: contractor training, regional product manufacturing versus regional product distribution, lead times required for product certification and approval in states and counties, job site technical assistance for contractors, franchising ICF construction crews, production capacity issues associated with a first “super-sized” product order, organizational structure over the next decade, and the qualifications required for future personnel. This was a significant outcome for a small-sized company that thought it was only facing a couple of key issues in the future.

Constructing a scenario is both intriguing and satisfying work. The case study, reflecting past activities, is a tool well-suited for gathering and organizing the data and information required to construct the future planning scenario. The scenario analyst has to be prepared to work in areas of high perceived uncertainty, combining work on topics of strategic interest to business leaders and managers to produce the most comprehensive, reality-anchored, and intriguing future options possible for exploration, consideration, and decision making. Most of all, it can be fun for the consultant and an immensely valuable cost-saving experience for the business.

The authors firmly believe that David and his executives will soon be singing, “Who’s afraid of the Big Bad Wolf, Big Bad Wolf, Big Bad Wolf? Who’s afraid of the Big Bad Wolf, tra la la la la!”

About the Authors

Dr. A. Gregory Stone received his Ph.D. in Instructional Systems Technology from Indiana University and currently serves as associate professor of entrepreneurship and marketing in Regent University’s School of Business. Stone’s primary research areas include servant leadership and exploring the use of entrepreneurship as an economic development tool to remove people with disabilities from welfare by assisting them in finding a career alternative.

Email: gregsto@regent.edu

Dr. Timothy A. O. Redmer received his Ph.D. in Accounting from Virginia Commonwealth University and currently serves as professor of accounting and finance in Regent University’s School of Business. Redmer’s areas of expertise include financial accounting and planning, budgeting, not-for-profit accounting, corporate finance, operations and production and managerial accounting.

Email: timored@regent.edu

References

- Ambler, S. (1995, July). Using use cases: Reduce development costs with use-case scenario testing. *Software Development*, 3(6).
- Archibald, R. D. (1992). *Managing high-technology programs and projects* (2nd ed.). New York: John Wiley & Sons, Inc.
- Armstrong, M. (1994, October). Blue-chip firms with a vision. *Personnel Management*, 26(10), 48-52.
- Bilow, S. C. (1995). Defining and developing user interface intensive applications with use cases. *Report on Object Analysis and Design*, 1(5), 28-34.
- Booch, G. (1994). Scenarios. *Report on Object Analysis and Design*, 1(3), 3-6.
- Brinkerhoff, R. (1998). Measurement phase: Evaluating effectiveness of performance improvement projects. In D. G. Robinson & J. C. Robinson (eds.), *Moving from training to performance: A practical guidebook* (pp. 147-174). San Francisco: Berrett-Koehler Publishers, Inc.
- Champy, J. (1995). *Reengineering management: The mandate for new leadership*. New York: HarperBusiness.
- Clemmer, J. (1992). *Firing on all cylinders: The service/quality system for high-powered corporate performance*. Burr Ridge, IL: Irwin Professional Publishing.
- Cockburn, A. (1997, September/October). Structuring use cases with goals. *Journal of Object-Oriented Programming*, 9(5), 35-40.
- Cockburn, A. (1997, November/December). Structuring use cases with goals. *Journal of Object-Oriented Programming*, 9(6), 56-62.
- Cockburn, A. (2000). *Writing effective use cases*. Reading, MA: Addison-Wesley.
- Constantine, L. L. (1995, March/April). Essential modeling: Use cases for user interfaces. *ACM Interactions*, 2(2), 34-46.
- Constantine, L. L. (1997, June). Usable objects: Useful cases. *Object Magazine*, 7(6). Reprinted in Constantine, L. L. (2001). *The peopleware papers*. Prentice Hall.
- Constantine, L. L., & Lockwood, L. A. D. (1999). *Software for use: A practical guide to the models and methods of usage-centered design*. Boston: Addison-Wesley.
- Constantine, L. L., & Lockwood, L. A. D. (2001). Structure and style in use cases for user interfaces. In M. van Harmelan (Ed.), *Object modeling and user interface design*. Boston: Addison Wesley.
- Finnigan, J. P., & Schmidt, W. H. (1992). *The race without a finish line: America's quest for total quality*. San Francisco: Jossey-Bass Publishers.
- Firesmith, D. G. (1994). Modeling the dynamic behavior of systems, mechanisms, and classes with scenarios. *Report on Object Analysis and Design*, 1(2), 32-36.
- Furland, F. M. (1995, May 22). Why do some "teams" fail? *Air Conditioning, Heating & Refrigeration News*, 195(4), 25-26.
- Galpin, T. J. (1996). *The human side of change: A practical guide to organization redesign*. San Francisco: Jossey-Bass Publishers.
- Graham, I. (1996). Task scripts, use cases and scenarios in object-oriented analysis. *Object-Oriented Systems*, 3(3), 123-142.
- Gupta, O. P. (1994, June). Fast-paced, continuous quality improvement. *Automotive Engineering*, 102(6), 69-73.

- Harrington, H. J. (1991). *Business process improvement: The breakthrough strategy for total quality, productivity, and competitiveness*. New York: McGraw-Hill, Inc.
- How the case method works. (n.d.). Retrieved in March, 2006, from Harvard University, Harvard Business School Web site: http://www.hbs.edu/research/case_method.htm
- Jacobson, I. (1994a). Basic use case modeling. *Report on Object Analysis and Design, 1*(2), 15-19.
- Jacobson, I. (1994b). Basic use case modeling (Continued). *Report on Object Analysis and Design, 1*(3), 7-9.
- Jacobson, I. (1995). The use-case construct in object-oriented software engineering. In J. M. Carroll (Ed.), *Scenario-based design* (pp. ?-?). NY: Wiley.
- Jacobson, I., Christerson, M., & Constantine, L. (1994). The OOSE method: A use-case-driven approach. In A. Carmichael (Ed.), *Object development methods*. New York: SIGS Books.
- Jacobson, I., Ericsson, M., & Jacobson, A. (1994). *The object advantage: Business process reengineering with object technology*. Reading, MA: Addison-Wesley.
- Kahn, H., & Wiener, A. J. (1967). *The year 2000: A framework for speculation on the next thirty-three years*. New York: Macmillan.
- Kaindl, H. (1995). An integration of scenarios with their purposes in task modeling. In *Proceedings of the Symposium on Designing Interactive Systems*. Ann Arbor: ACM Press.
- Klubnick, J. P. (1995). *Rewarding and recognizing employees: Ideas for individuals, teams and managers*. Chicago, IL: Irwin Professional Publishing.
- Kruchten, P. (1999). *The rational unified process: An introduction*. Reading, MA: Addison-Wesley.
- Kulak, D., & Guiney, E. *Use cases: Requirements in context*. Boston, MA: Addison-Wesley, 2000.
- Lee, J., & Xue, N. (1999, July/August). Analyzing user requirements by use cases: A goal-driven approach. *IEEE Software, 16*(4), 92-101.
- Lilly, S. (2000, January). How to avoid use-case pitfalls. *Software Development, 8*(1), 40-44.
- Lilly, S. (1999). Use-case pitfalls: Top 10 problems from real projects using use cases. *Proceedings of TOOLS USA '99*, IEEE Computer Society.
- McGregor, D. M. (1960). *The human side of enterprise*. New York: McGraw-Hill.
- McMenamin, S. M., & Palmer, J. (1984) *Essential systems analysis*. Englewood Cliffs, NJ: Prentice Hall.
- Nuese, C. J. (1995). *Building the right things right: A new model for product and technology development*. New York: Quality Resources.
- Parker, G. M. (1990). *Team players and teamwork: The new competitive business strategy*. San Francisco: Jossey-Bass Publishers.
- Parker, G. M. (1994, October). Cross-functional collaboration. *Training and Development, 48*(10), 49-52.
- Peters, T. J., & Waterman, R. H. (1982). *In search of excellence: Lessons from America's best-run companies*. New York: Warner Books.
- Potts, C. (1995). Using schematic scenarios to understand user needs. In *Proceedings DIS '95*. Ann Arbor, MI: ACM Press.
- Regnell, B., Kimbler, K., & Wesslén, A. (1995). Improving the use case driven approach to requirements engineering. *RE 95: Proc. Int'l Symposium on Requirements Engineering*. Los Alamos, CA: IEEE Computer Society Press: 40-47.

- Rosenberg, D., & Scott, K. (1999) *Use case driven object modeling with UML: A practical approach*. Reading, MA: Addison-Wesley.
- Royer, T. (1995). Using scenario-based designs to review user interface changes and enhancements. In *Proceedings DIS '95*. Ann Arbor, MI: ACM Press.
- Schneider, G., & Winters, J. P. (1998). *Applying use cases: A practical guide*. Reading, MA: Addison-Wesley.
- Scholtes, P. R. (1988). *The team handbook*. Madison, WI: Joiner Associates, Inc.
- Silber, J. M., & Smith, A. W. (1994, September-October). TQM success—or, it's the process, stupid! *Journal of Property Management*, 59(5), 12-17.
- Smith, D. K. (1996). *Taking charge of change: 10 principles for managing people and performance*. Reading, MA: Addison-Wesley Publishing Company.
- Smith, P. L. (1991, May-June). A CFO's view: Invest in "quality teams" for decision making. *Financial Executive*, 7(3), 51-57.
- Texel, P. P., & Williams, C. B. (1997). *Use cases combined with Booch OMT UML*. Upper Saddle River, NJ: Prentice Hall.
- Weidenhaupt, K., Pohl, K., Jarke, M., & Haumer, P. (1998, March/April). Scenarios in system development: Current practice. *IEEE Software*, 15(2), 34-45.
- Wieggers, K. (1997, March). Use cases: Listening to the customer's voice. *Software Development*, 5(3), 49-55.
- Wirfs-Brock, R. (1993, November-December). Designing scenarios: Making the case for a use case framework. *Smalltalk Report*.
- Wirfs-Brock, R. (1994, February). The art of designing meaningful conversations. *Smalltalk Report*.
- Wirfs-Brock, R. (1995). Designing objects and their interactions: A brief look at responsibility-driven design. In J. M. Carroll (Ed.), *Scenario-based design*. NY: Wiley.
- Yukl, G. A. (1998). *Leadership in organizations* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

Scenario-planning techniques are being used to help organizations better understand the implications on a broad range of decisions affecting business strategy, investment prioritization and operations. Of particular note to management accountants is that many organizations are looking to integrate aspects of scenario planning into near-term management processes such as risk management, business case development, budgeting, forecasting and competitive analysis. Examples include

Figure 1: Scenario planning work approach.

- Define scope, issues and time horizon.
- Define the Issues, decisions or key variables that need to be evaluated.
- Set the scope of study
- Agree on an appropriate time horizon for the scenarios. Define key drivers.

Scenario planning methodology is appropriate to contexts involving uncertainty. It does not predict the future, but explores plausible futures, facilitating adaptive responses and contingency planning.

While scenario planning is a core feature of the project, it also includes a number of other complementary elements, including: public lecture events at Queens University; and interviews with stakeholders to identify the range of perspectives held in relation to food and farming sustainability, and explore options for policy or practical initiatives.

This approach may, for example, involve the use of agroforestry to reduce nutrient runoff from farmland, or technical solutions, such as, air scrubbers to mitigate GHG emissions from factory farms.

Types of Scenario Planning.

Quantitative scenarios are financial models that allow for the presentation of best- and worst-case versions of the model outputs. These models can be quickly changed by altering a limited number of variables/factors. Quantitative scenarios are also used to develop annual business forecasts. These models assume key variables are known and that relationships among them are fixed.

Operational scenarios are one of the most common types of scenario planning an organization will undertake internally.

Scenario Planning Work Approach.

Actions to take. Secure commitments from senior management, select team members and organize scenarios around key issues to be addressed and evaluated.