A Methodology for Assessing Performance-Based Scenario Planning

Thomas J. Chermack
University of Minnesota

Scenario planning is an expensive organizational intervention and experts have often justified their high salaries based on the assertion that expertise in conducting the process is rare. As the popularity of scenario planning has increased, so has the number of consultants and firms claiming expertise in facilitating the process, thus making scenario planning more available to organizations than ever before. This unique situation poses a challenge as scenario planning becomes more frequently applied in more diverse settings. As the process of scenario planning itself becomes more mature, conversations among its practitioners are beginning to center around the intended outcomes of their interventions.

Some have asserted that scenario planning produces results in several conceptual domains including that of financial performance (Wack, 1985a; van der Heijden, 1997; Schwartz, 1991; Ringland, 1998, 2002; Georgantzas & Acar, 1995). Evidence of such results are rarely examined or reported (Pearce, Freeman & Robinson, 1987). While some authors have argued that scenario planning should appropriately result in improved participant learning (de Geus, 1988; Shoemaker, 1995; Godet, 2001), the argument presented here positions performance as the primary output with learning as a key driver of that outcome. Key authors in scenario planning have, in fact emphasized the learning component with titles such as *Learning From the Future,* (Fahey & Randall, 1998), *Accelerating Organizational Learning with Scenarios,* (van der Heijden, Bradfield, Burt, Cairns & Wright, 2002), and De Geuss' (1988) adage that learning capacities may be the ultimate competitive advantage. While learning may be a required and critical component of scenario planning, the views advocated in much of the scenario planning literature imply that performance improvement is an outcome of the learning process. The core argument of this paper is that explicit performance improvement at several levels should properly drive the scenario planning process and opportunities for performance improvement are identified by a performance need (Deming, 1982).

Scenarios are being increasingly applied in differing settings by varying groups of people from diverse backgrounds (Fahey & Randall, 1998). To date, scenario planning has found its home primarily in practice, although some academic programs are beginning to offer content pertaining to scenarios in discussions of strategy. Examples and studies of scenario planning have centered on case studies (Ringland, 1998; 2002), and very few projects reflecting scholarly research or theoretical examination have been produced. Authors in the field of Human Resource Development (HRD) have contributed some insight around learning in scenarios (Chermack & van der Merwe, in press), scenarios coupled with strategic planning (Swanson, Lynham, Ruona & Provo, 1998), an integrated definition and outcome variables (Chermack & Lynham, 2002) and the challenge for applying evaluation and theory building methods to the process (Chermack, 2002; Chermack, Lynham & Ruona, 2001).

Structure and Theoretical Framework

The purposes of this paper are: 1) to provide a rationale supporting performance improvement as the primary outcome of

scenario planning 2) to posit performance improvement theory as a core theoretical foundation of the scenario planning process, and 3) to provide heuristic for evaluating the performance of the proposed scenario planning outcomes. The strategy for accomplishing these purposes will be to first provide an overview of the three levels of performance improvement, and second, the theoretical foundations of performance. Once this frame is established, a discussion of scenario planning, its definitions and current intended outcomes will be presented. It will the be argued that effective scenario planning not only addresses these three levels of performance, but additionally incorporates the theoretical foundations of performance improvement. In constructing this argument, the combination of the three levels of performance and the theoretical foundations of performance improvement is realized in a powerful evaluative tool.

Performance Improvement

When considering the substantial investments executives make in their formulation of strategy and organization positioning, a core expectation is that planning efforts will provide insights leading to improvements in several domains (Drucker, 1964; Rummler & Brache, 1995; Fahey & Randall, 2001). Executives expect that as a result of effective planning, they make more informed decisions, check their assumptions about what they believe to be true, and ultimately see the organization in a "different" position than it was prior to the planning efforts (Wack, 1985c). The overall expectation of improvement can be thought of as performance.

What is Performance?

Performance has become one of the most talked about aspects of organizational improvement efforts in recent years, yet performance itself remains a mystery. Swanson's (1999) discussion of performance improvement foundations provides a broad yet well defined perspective of performance along with the means to assess it, describe it, and explain it in more detail. While the performance perspective has received criticism on the grounds that it neglects the "human" elements in organizations and improvement efforts, "the best PI theory and practice will in the end validate the need for and contribution of human expertise to PI" (Swanson, 1999, p. 4). Validating the needs and contributions of human expertise to performance improvement is precisely what this paper intends to provide, although, in this case, it is specifically pertaining to the process of scenario planning.

Performance has been defined as: "the valued productive output of a system in the form of goods or services" (Swanson, 1999, p. 5). Put simply, "performance is accomplishment and fulfillment, not potential or capability" (Swanson, 1999, p. 1). Swanson & Holton (2001) have also made the case that performance is considered *mission-related* output, meaning that the goals of the system sponsoring the improvement effort will define the appropriate performance outputs.

Levels of Performance

Regarding the link between performance and strategy, Rummler & Brache stated: "The most powerful strategy implementation tools we have found are those that help us effectively design and manage performance at the organization, process and job/performer levels" (1995, p. 84). Thus, a clear strategy for evaluating the outcomes of the scenario planning processes is to evaluate changes in performance at these three levels.

The organization level. Rummler and Brache (1995) defined performance at the organizational level in terms of three core variables, namely, 1) organization goals 2) organization design and 3) organization management. Organization goals frequently include a focus on productivity, cycle time, cost, and profit improvement efforts. Performance focused analysts "design an organization that enables the goals to be met" (Rummler & Brache, 1995, p. 37), thus a focus on the input-output relationships within the organization allow a design that accommodates and supports the organization goals. Goals, performance, resources and interfaces between functions are all areas requiring frequent assessment "help identify what needs to get done (goals), the relationships necessary to get it done (design), and the practices that remove the impediments to getting it done (management) (Rummler &

Brache, 1995, p. 43). The organization level of performance provides the foundation for understanding, analyzing and managing performance at the process and individual levels.

The process level. Commonly viewed as how work is accomplished, processes can be more specifically defined as value chains in which each step adds value to the previous step. Based on a view that effective processes produce effective organizations, Rummler & Brache (1995) asserted that process goals, design, and management are the key variables to address for improving process performance. Process goals are considered sub-goals of organization goals, and should be designed to efficiently convert process inputs to process outputs. Managing, analyzing and adjusting processes goals, performance, resources and interfaces ensure the maintenance of high levels of process performance (Rummler & Brache, 1995). Targeted as the level with the greatest opportunity to contribute to performance improvement, the process level is largely ignored, and often misunderstood.

The job/performer level. Jobs must be designed to support process steps, enabling the achievement of process goals, and in turn, organization goals. Job goals must be aligned with process goals and jobs must be designed and structured such that the performer can achieve those job goals (Rummler & Brache, 1995). Job management is considered a function of 1) performance specifications 2) task support 3) consequences 4) feedback 5) skills and knowledge and 6) individual capacity. These components of job management, if effectively addressed, help job performers achieve process goals, leading to the fulfillment of organization goals.

Summary

The levels of performance improvement advocated by Rummler & Brache (1995) have been summarized in brief. Each level of performance has implications for performance improvement efforts and effective performance improvement efforts will address all three levels. The next section details the theoretical foundations of performance improvement. Once these foundations have been described, the ability of scenario planning to address both the three levels of performance and the theoretical foundations will be examined.

Theoretical Foundations of Performance Improvement

Swanson (1999) provided the theoretical foundations of performance improvement for consideration in the field of HRD. The proposed theoretical foundations of performance improvement have been 1) economic 2) psychological and 3) system theories. These theoretical foundations are to be viewed as the minimum requirements -- that in any context, in any global setting, performance improvement will *at a minimum* draw on theories of economics, psychology, and systems theories and perspectives. Each theoretical foundation is, indeed, quite general and incorporates much room for further specification.

Economic foundation. "How could responsible performance improvement not include direct analysis, action, and measurement of economic outcomes?" (Swanson, 1999, p. 14). The economic foundation informs the performance improvement specialist that *one* indicator of performance is financial results, or return on investment. Alternatively, improved performance in the economic foundation results in improved financial performance. The economic foundation relies on theories of supply and demand, scarce resources, and views on managing capital. For example, Swanson (1999) cited scarce resource theory, sustainable resource theory and human capital theory as theories that inform the economic view of performance in organizations. The view that business expenditures and interventions should result in a realization of return has been long-held view (Drucker, 1964).

Psychological foundation. The psychological foundation "includes theories of learning, human motivation, information processing, group dynamics, and psychology-based theories of how people make decisions and behave in organizations" (Swanson, 1999, p. 14). While professionals have focused heavily on the behaviorist school of psychology, recent interests in situated learning (Lave & Wenger, 1991), social constructionist learning (Turnbull, 2002), team learning (Schrage, 1990) and other philosophical approaches to human cognition are producing strong theoretical arguments and

business applications. Alternative approaches to learning are, and should be valued in performance practice. The examination of mental models (Johnson-Laird, 1983), decision-making (Morecroft, 1985; Ford & Sterman, 1998; Simon, 1957), and alterations in problem-solving approaches all exhibit vast potential for evaluating psychological measures of performance improvement, particularly in the context of scenario planning.

System foundation. While much has been written about systems thinking and Senge's (1990) *The Fifth Discipline* is often cited in business literature, the importance of system thinking cannot be overstated. System theory has expanded into a number of sub-fields including mathematical chaos theory, complex adaptive systems, biological systems applied in human contexts, and highly abstract teleogenic thinking incorporating artificial intelligence, servomechanisms, and industrial engineering perspectives. Key works that provide these perspectives applied to business settings include Wheatley, (1999), Amidon, (1997), Allee, (1997), Gleick (1987), among many others. The system perspective informs the performance improvement specialist that components of business problems cannot be diagnosed and solved in isolation from operation in their business contexts. System theory informs the performance improvement professional of more efficient ways to work with complex problems in their natural, interconnected and interdependent settings.

Scenario Planning: A Definition and Proposed Outcomes

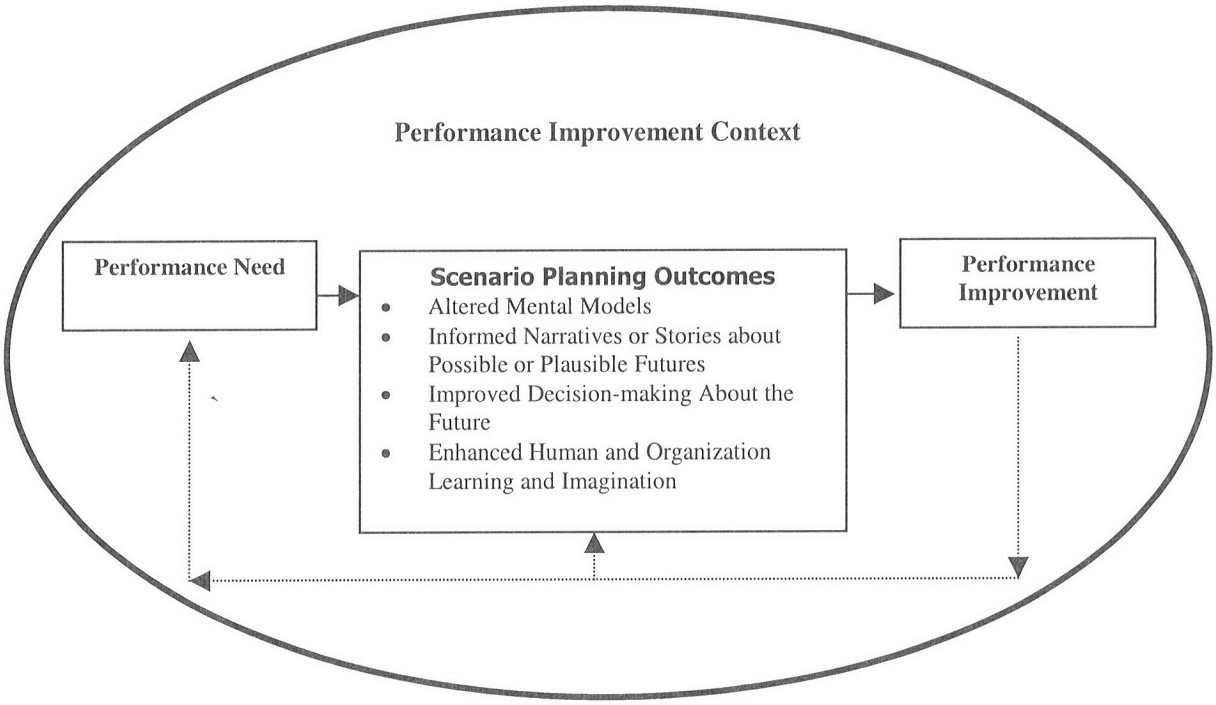
Scenarios have been defined as tools "for ordering one's perceptions about alternative future environments in which one's decisions might be played out. Alternatively: a set of organized ways for use to dream effectively about our own future" (Schwartz, 1991, p. 4). *Scenario planning* has been defined as "a process of positing several informed, plausible and imagined alternative future environments in which decisions about the future may be played out, for the purpose of changing current thinking, improving decision making, enhancing human and organization learning and improving performance" (Chermack & Lynham, 2002, p. 376). Some key outputs of the scenario planning process are plausible alternative stories about the future, altered mental models, improved decision-making, enhanced human learning, and improved performance (Schwartz, 1991).

Chermack & Lynham (2002) conducted a literature review and synthesis around the definitions and outcomes of scenario planning. Their efforts resulted in a definition of scenario planning, a general process model, and some recommendations for future research in validating the process of scenario planning. Of concern in this discussion is the process model displayed in Figure 1. The importance of Figure 1 is in its positioning of a clearly defined performance need, identification of drivers for performance improvement, and positioning of performance improvement as the overarching outcome of scenario planning. As the basis of a theoretical model, Figure 1 implies a *requirement* that changed thinking, improved decision-making, enhanced learning, and improved performance are present for the conclusion that successful scenario planning has taken place. With this Figure as a backdrop, a more focused discussion of performance itself, and precise measures of how scenario planning improves performance can be explored.

Scenario Planning and the Levels Performance Improvement

The link between scenario planning and performance improvement theory seems obvious, yet scenario planning is increasingly applied without a performance need and without a theoretical basis, making evaluation a difficult exercise. Thus, the importance of the performance need in the performance improvement context cannot be overstated. van der Heijden et al., (2002) identified a "lack of purposefulness" (p. 3) as a major contributor to scenario projects that fail. It is in the performance need, determined by a thorough analysis that such purposefulness can be discovered and acted upon (Swanson, 1994, Holton, 1999).

Figure 1. Scenario Planning Outcomes: A Strategic Process and Driver of Performance Improvement



Scenario planning at the organization level. Scenario planning must produce results at the organizational level. While evaluation efforts have been minimal, one study in particular attempted to analyze the link between engagement in scenario planning and firm performance. Phelps, Chan & Kapsalis (2001) evaluated scenario planning projects in the water and IT industries. In the water industry, firm performance measures included 1) return on capital employed 2) water quality 3) variance in water pressure over time and 4) supply interruptions. In the IT industry, firm performance measures included 1) annual growth rates of client companies 2) return on capital employed and 3) net profits. The authors concluded that scenario planning had a considerable positive affect on firm performance in the water industry, although the service score showed a considerable decrease. The IT industry also showed a positive association between scenario planning and performance, although it was less powerful and was based on a questionably small sample size. Further studies such as these are needed to establish the link between scenario planning and performance in terms of economic benefit. Studies focused on the relationship between scenario planning and the achievement of organization goals are particularly advocated as one step in a comprehensive program of scenario evaluation.

Several case studies, for example, Shell Oil, (Wack, 1985a; 1985b), British Airways (Moyer, 1996) and Nokia, (van der Heijden et al., 2002) examine the abilities of organizations to revive and renew themselves, and the fact that these companies are still flourishing despite some extremely challenging situations is one indicator that scenario planning might help an organization and its leaders cope with uncertainty. A company's ability to survive may be the most basic indicator of performance at the organization level. Other indicators may be specific to industry or company, but effective scenario planning will select these specific indicators, measure them and address them.

Scenario planning at the process level. Only one study was found that explicitly examined the effects of scenario planning on process capabilities or functions. A case study by Burt & van der Heijden (in Ringland, 2002) contained as one of its primary aims the reconfiguration of supply chain processes. While it is clear that scenario thinking might be used to develop alternative processes and explore more efficient means of delivering products and services, scenarios have rarely been applied in this context. However, some

scenario projects such as the IT company International Computers Ltd. (Ringland, 2002) have incorporated systems diagrams to map information markets in process formats, or as in the case of Diamler-Benz Aeorspace (Tessum, 1997) systems diagrams were used to map early warning systems as processes of contingency planning. van der Heijden et al., (2002) suggested that organizational change is effectively brought about through process change, although "process gain requires persistence and consistency over an extended period" (p. 84).

Some preliminary conceptual arguments for using scenarios in the process context include the use of scenarios as "cognitive objects" (Johnson, personal communication) in which scenarios are vehicles for process management and knowledge transfer. These are key areas for further investigation that might use scenarios to explore alternative processes for improved efficiency and storage spaces for descriptions of knowledge work. Research studies that document the effects of scenarios applied to processes would provide much value by potentially providing an additional application area for scenarios and as Rummler and Brache stated "the process level has been the least understood level of performance" (1995, p. 44) and as such, the process level provides the most potential for improving performance.

Scenario planning at the job/performer level. Perhaps more than any other level, anecdotal evidence has supported the claim of individual performance improvement. Whether through learning via intense trend analysis (Wack, 1985b), shared mental models (van der Heijden, 1997), or increased availability of information for more precise, long-view oriented decision-making (Schwartz, 1990), virtually all reports of scenario application address the performance of the individual. However, none reports an empirical study, with measures of individual performance improvement. van der Heijden et al., (2002) stated that scenarios help individuals re-perceive reality from multiple perspectives, provide a forum for people to think creatively, and are effectively used as communications tools. These uses of scenarios are all aimed at improving individual performance, although, there is little beyond participant claims of improvement in these areas.

Summary

The three levels of performance improvement, organizational, process, and job/performer have been reviewed in the context of scenario planning. Where appropriate, examples of research or case studies in scenario planning have been offered, although a general lack of research that measures performance improvement at any level has been revealed. Alternatively, a promising research agenda has been constructed.

Scenario Planning and the Theoretical Foundations of Performance Improvement

Three levels of performance have been identified and reviewed in the context of scenario planning. Although research reporting performance at each of these levels is not abundant, the conceptual case for investigating performance at these three levels has been made and supported by prominent authors in the scenario planning literature. With these *levels* of performance improvement established, we will now turn to the theoretical foundations of performance improvement to ascertain a variety of *types* of performance that can be evaluated in scenario planning.

Scenario Planning and the Economic Foundation. Scenario planning must produce financial benefit in order to justify its expense. While nearly all of the evidence of scenario planning's effectiveness is manifest in anecdotal stories, there is a universal empirical indicator that must not be overlooked: most companies claiming that scenario planning is an effective process are still thriving. While this is not true in *all* cases, the vast majority of scenario planning success stories come from companies that are still fulfilling their core missions. Statoil (Hodgson, in Ringland, 2002) Daimler-Benz Aerospace (Tessum, 1997), and Norwegian Oil and Gas (Stokke, Ralston, Boyce & Wilson, 1990) are examples of companies that claim scenario planning has helped them navigate uncertain terrain and remain economically viable in difficult times.

Economic measures might include company financial statements, stock market

performance, and shareholder value, but these are not the only economic measures available. Improvements in process and job/performer efficiency and effectiveness can also be translated in to economic returns based on time, quantity, or quality improvements. Just as general process reengineering and job/performer training are expected to result in a return on investment, or return on capital employed, so should any scenario planning effort.

Scenario Planning and the Psychological Foundation. "Understanding the psychological context in which managers approach the future and make decisions is key to improving strategic thinking" (van der Heijden et at., 2002, p. 41). Scenario planning draws upon theory in the psychological foundation for provoking changes in participant worldviews, challenging participant assumptions, and providing new contexts in which learning is a focused output. Chermack & van der Merwe (in-press) outlined the explicit links between constructivist learning and scenario planning, including an examination of Piaget's (1977), Vygostky's (1986) and Lave & Wenger's (1991) contributions to learning theory. van der Heijden (1997) has also supported the view of constructivist learning as the primary mode of learning in scenarios.

At the core of linking scenario planning and learning is the notion that participants must challenge their assumptions about what is true and what is possible. Wack (1985) argued that "the most important purpose of the scenario building process is to shift the thinking of the leadership inside the organization about what might happen, in the future, in the external environment" (p. 14). Senge (1994) posited a direct link between mental models and scenario planning. A wealth of literature and theory can be examined in efforts to explain changes in thinking processes and altered mental models and how such changes might translate into improved strategy-making and decisions about critical business issues. However, such efforts have been minimal.

Certainly, if learning is a core element of the scenario planning process as has been advocated, (Fahey & Randall, 1998; van der Heijden, et al., 2002; De Geuss, 1988) tools for measuring changes in participant thinking patterns and approaches to problem consideration and solution formulation in strategic contexts must be developed. By utilizing the theoretical foundations of performance improvement, and the levels of application advocated in this paper, a basic scheme for evaluating these psychological changes is apparent.

Scenario Planning and the System Foundation. System theory, thinking and practice guide the scenario planning practitioner through different ways of conceiving of organizations such that they may be seen as whole systems themselves, and also as components of larger nation and community systems. The importance of this view is in the recognition that changing organizations have increasingly larger effects on their environments, communities, nations, and the world.

Combining the Levels and Foundations of Performance Improvement

A unique perspective is realized when the levels of performance and the theoretical foundations of performance improvement are combined.

While it is beyond the scope of this paper to fill in the cells of the matrix with specific theories or measures, the matrix can be used in several ways. In general, the matrix can be used as a diagnostic tool. As such, the scenario planner can assess the level of performance at any cell within the matrix to detect disconnects. Much like Swanson's (1994) Performance Diagnosis Matrix of Enabling Questions, the matrix provides a platform on which the diagnostician can assess current levels of performance. Naturally, with the use of the matrix as a diagnostic tool, it follows that it would also be used as an evaluative tool. Performance disconnects identified in the diagnosis can be evaluated after the scenario planning project to asses improvement at a given level in terms of given measures. The matrix can also be used as a tool for selecting theories. Lynham & Chermack (2001) provided a matrix for selecting sound theories underlying organization development interventions.

Figure 2.
Rubric for evaluating scenario planning in performance contexts.
(Based on Swanson, 1994 and Rummler and Brache, 1995)

Level of Performance	Theoretical Foundation and Evaluation Measure		
	Economic	Psychological	System
Job/Performer	Performance specifications Task support Consequences Feedback Skills and knowledge Individual capacity	Performance specifications Task support Consequences Feedback Skills and knowledge Individual capacity	Performance specifications Task support Consequences Feedback Skills and knowledge Individual capacity
Process	Goals Design Management	Goals Design Management	Goals Design Management
Organization	Goals Design Management	Goals Design Management	Goals Design Management

Contributions, Conclusions, and Implications for Further Research

This paper has examined the levels of performance improvement advocated by Rummler & Brache (1995), and the theoretical foundations of HRD (Swanson, 1999) in the context of scenario planning. Specifically, this article has realized the combination of these two perspectives in the form of a matrix for diagnosing, or evaluating the theory and practice of scenario planning. While the content presented in this article is strictly conceptual, the framework presented provides the foundation of a comprehensive means of ensuring performance based scenario planning.

What is clear at this point is a lack of research and evaluation happening in the application of scenario planning. As scenario planning is increasingly applied, responsible practitioners and theorists will want to produce results for their clients and evaluate their efforts. Further, ensuring results and evaluating projects will help scenario planners avoid the pitfalls often associated with the use of faddish consulting tools that fade once their inadequacies are uncovered. Given the potential in the tool of scenario planning, HRD professionals have an opportunity to lead the maturation and development of the process.

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