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Developing Robust Strategy for Uncertain Times: Expanding our Concept of Management Control to Deal with Dynamic Markets

PART II: MANAGEMENT CONTROL SYSTEM DESIGN FOR MEETING THE CHALLENGE

R. Murray Lindsay, FCPA, FCMA, PhD

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About the Author

R. Murray Lindsay is the former Dean of the Faculty of Management and Professor of Accounting at the University of Lethbridge. Prior to this, he taught at Western University in the Richard Ivey School of Business and the Edwards School of Business, University of Saskatchewan.

Dr. Lindsay's current research interests in management accounting lie in several areas. He believes the development of the field requires that academic research must not only remain rigorous, but must become more relevant to practice. To this end, he is developing a comprehensive methodology focused around the case study method. As an early follower of the Beyond Budgeting movement, Dr. Lindsay continues to critically examine this model of performance management and how management control systems must change to foster employee empowerment and innovation. His research in this area has earned him an award from the International Federation of Accountants. More recently, his research has begun to examine the role of management control systems in facilitating strategic adaptation and why transformational change must be socially constructed.

Dr. Lindsay was an early advocate of the quality and just-in-time (JIT) movements and has worked with numerous organizations to implement the principles of quality and employee empowerment in both the for-profit and not-for-profit sectors. Since 2003, Dr. Lindsay has been a perennial presenter in performance management in the Certified Management Accountants of Canada (CMA Canada) legacy Executive and CFO professional development programs. He was the President of the Management Accounting Section of the American Accounting Association in 2013-14 and is currently a member of the editorial board of *Contemporary Accounting Research*.

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Acknowledgements

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Executive Summary

The management control challenge introduced in Part I involves the need to manage the tension between the execution and adaptation of strategy when the classical view of strategy, based on the assumptions of stability and predictability, is no longer appropriate (i.e., when a company operates in a dynamic environment). Within the literature on strategy, there is fundamental agreement that conventional control methods, which were developed for the purpose of facilitating execution, are inappropriate for contributing to strategic adaptation in these circumstances, which reflects the situation of interest for this study.

With this finding as a starting point, Part II investigates the design of management control systems to facilitate strategic adaptation in the course of examining the differences between execution and adaptation across a number of dimensions of control. The results of this comparison are summarized in Table 4. Several of the recommendations arising from this investigation address the two issues (or barriers) impeding successful adaptation, as discussed in Part I.

The first issue impeding successful adaptation, cultural lock-in, leads to pressures, mindsets, and distortions in judgment that reinforce the status quo. Addressing this problem requires a dramatic reorientation of decision-making: from the individual to the team, from the decision maker to the decision-making process, and from the executive to the organization. In addition, new ways of evaluating strategic alternatives must be employed because traditional (i.e., financial) approaches are often biased in favor of maintaining the status quo. Lastly, in some situations, senior management should isolate exploration activities from those aimed at exploiting present-day strategy by means of establishing separate organizational units to prevent each activity from interfering with the other.

The second issue raised in Part I involved the implications for managing strategy in a dynamic environment (i.e., when strategic uncertainty reigns). In such circumstances, it is necessary to more fully embrace strategic uncertainty within the decision-making process to increase the odds of achieving successful outcomes. Methods for enacting this finding include:

- routinely collecting information to assist in monitoring the company's strategic uncertainties followed by interpreting and debating the meaning and strategic significance of this information;
- adopting a decision-making style that promotes divergent thinking, one that roots out errors associated with the use of information that may be incomplete, ambiguous and filtered by cognitive distortions and beliefs; and
- developing strategies that are "robust" (i.e., able to accommodate alternative states of nature without exposing the company to excessive financial risk). In practice, this recommendation involves developing a portfolio of individual strategic initiatives combined with the discipline to subject new ideas to an emergent process of discovery.

One further finding, reflecting the role senior management plays in strategic adaptation, arises from this report's investigation. Transformational change needs to be socially constructed by a diverse team composed of operationally-focused personnel using an emergent process of discovery that is based on *subjecting new ideas to low-cost experiments and basing further commitments on the learning that occurs or on how the future unfolds*; it should not be determined and imposed on the organization by senior management. This recommendation reflects not only the genesis and evolution of innovative ideas, based on the historical record, but it also serves to reduce resistance to change by helping more people converge towards a common view. Senior management's role is to *pilot* the process of strategic adaptation. In particular, senior management—rather than business unit heads—must set the context for adaptation, unfreeze dominant mindsets, manage the difficult trade-offs between the present and the future, be concerned and mindful about what the future may hold, and bear the risk of pursuing transformational change. This characterization is far removed from the conventional view depicting senior management as the architect of company strategy.

Overall, the analysis indicates that very different control systems are required to manage the execution and adaptation of strategy, resulting in the need to develop two distinct systems, managed in parallel, to best serve the requirements of each activity.

Introduction

The purpose of Part I of this two part research paper was to provide the motivation and context for the present discussion on the design of systems for meeting the management control challenge in dynamic markets (i.e., when the competitive environment is both unpredictable and malleable). This challenge was framed as follows: how does a company adequately prepare *today* for an uncertain and often unknowable *tomorrow*, while continuing to deliver excellence today? This challenge relates to the need to manage the tension between the execution and adaptation of strategy when the classical view of strategy, based on the assumptions of stability and predictability, is no longer appropriate. For the purposes of brevity (and to better reflect the nuances of the specific activity under discussion), this challenge will sometimes be framed in the present discussion as a contrast between exploitation versus exploration or the management of strategic commitment versus the management of strategic uncertainty.[1] Recall that strategic uncertainty refers to the known and unknown uncertainties and contingencies that could threaten or invalidate a company's current strategy and/or management's strategic vision for the future.[2]

Part I introduced two important points that control system designers must address. The first is recognizing that cultural lock-in represents a formidable barrier preventing organizations from successfully adapting. Abating cultural lock-in requires that senior management establish a process for periodically assessing and critiquing the dominant assumptions underlying company strategy. Additionally, decision-making processes must be designed to counter the cognitive biases that serve to reinforce cultural lock-in and, ultimately, the status quo.

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1 The terms "exploitation" and "exploration" are due to James March and are widely used in the academic literature. See James March, "Exploration and Exploitation in Organizational Learning," *Organization Science* 2 (1), 1991, pp.171-87.

2 Robert Simons, *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal* (Boston: Harvard Business School Press), 1995, p.94-95.

The second point is that management cannot continue to approach strategy in classical terms when operating in dynamic environments, which reflects the situation of interest for this paper. This circumstance calls for companies to adopt a different conception of strategy, one based on a shaping posture. As summarized in Part I, basing strategy on a shaping posture requires placing customers at the heart of strategy and creating and recreating value for them by developing new sources of temporary advantage. However, this process occurs within an environment where the future is inherently unpredictable and organizations must make strategic commitments prior to unequivocal market signals. Consequently, companies must embrace strategic uncertainty by developing strategies that are "robust"—capable of performing well in a variety of possible future environments—without exposing themselves to excessive financial risk if a strategic initiative fails.

Based on these considerations, there is fundamental agreement in the literature on strategy that conventional control systems, which were developed for the purpose of facilitating execution, are inappropriate for facilitating strategic adaptation in dynamic environments. Instead, the management of strategic uncertainty (i.e., "Will our strategy remain valid in the future?" or "Where should we commit next?") must be considered as distinct and separate from the management of strategic commitment (i.e., "How can we best execute our strategy?") to best serve the requirements of each activity.[3] As Foster and Kaplan explain:

> What makes the creative [adaptive] process difficult for management is that it has no recognizable parallels in the operating [execution] disciplines of decision making, measurement, and control found at the heart of today's corporations. We are dealing with entirely different processes. The role and meaning of information is different. The role and meaning of decision making is different. And the role and meaning of measurement and control are entirely different.[4]

This brings us to the focus of Part II of this paper: beginning the urgent task of examining the differences in control systems involved in the execution and adaptation of strategy.

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3   See Derek Abell, "Competing Today While Preparing for Tomorrow," *Sloan Management Review* (Spring 1999); Robert Burgelman, "Intraorganizational Ecology of Strategy Making and Organizational Adaption: Theory and Field Research." *Organization Science* 2(3); Richard Foster and Sarah Kaplan, *Creative Destruction: Why Companies that are Built to Last Underperform the Market—and How to Successfully Transform Them* (New York: Doubleday), 2001; Ellen J. Langer, *Mindfulness*, Reading, Mass.: Addison-Wesley, 1989; Richard Pascale, "Surfing the Edge of Chaos," *Sloan Management Review* (Spring 1999); Rita Gunther McGrath and Ian Macmillan, Discovery-Driven Growth: A Breakthrough Process to Reduce Risk and Seize Opportunity (Boston: Harvard Business School Publishing), 2009.

4   Richard Foster and Sarah Kaplan, *Creative Destruction: Why Companies that are Built to Last Underperform the Market—and How to Successfully Transform Them* (New York: Doubleday), 2001, p.121.

The paper proceeds as follows: the next section, representing the core of the discussion, reports on the changes in management control systems involved in promoting and facilitating strategic adaptation. To offset this paper's emphasis on strategic adaptation, Section Three issues the warning that companies cannot neglect strategic execution; instead, management must strike an appropriate balance between execution and adaptation based on the company's specific circumstances. In addition, the development of new strategies must be anchored in a company's core values and purpose. Section Four then examines Robert Simons' levers of control model—the only other model appearing in the accounting literature addressing strategic adaptation—through the lens provided by this paper's investigation. A summary of the study's major findings and concluding comments follow in Section Five.

Management Control System Design Considerations

This section consists of examining changes in management control systems (consisting of both process and structure) for the purpose of facilitating strategic adaptation when companies operate in dynamic environments. This environment resembles a complex adaptive system where the future is both unknown and unknowable. Here, strategic uncertainty reigns and decision-making becomes a probability exercise, much like a game of chance. This is the situation giving rise to the metaphor of Schrödinger's cat and Raynor's strategy paradox that arises from it (as described in Part I of this paper). Raynor's paradox explains how strategies with the greatest possibility of success also entail the greatest probability of failure because the need to make a costly, often irreversible commitment of resources exists alongside the irreducible uncertainty of the future. And this occurs even when companies commit reasonably based on the information possessed at the time the decision was made.[5]

In dynamic environments, companies must focus on developing a superior decision-making process, motivated by the knowledge that, over time, outcomes will take care of themselves. Michael Mauboussin, who has studied the uncertainty inherent with investing in the stock market in depth, states this is the method distinguishing individuals achieving the most satisfactory long-term results across various probabilistic fields.[6] He cites a 2001 Harvard University commencement speech by Robert Rubin, former United States Treasury Secretary and Wall Street veteran:

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5   Michael Raynor, *The Strategy Paradox* (New York: Doubleday), 2007.

6   Michael Mauboussin, *Decision-Making for Investors: Theory, Practice and Pitfalls* (Legg Mason Funds Management, Inc.), May 24, 2004.

> Any individual decision can be badly thought through, and yet be
> successful, or exceedingly well thought through, but be unsuccessful,
> because of the recognized possibility of failure in fact occurs. But over
> time, more thoughtful decision-making will lead to better overall results,
> and more thoughtful decision making can be encouraged by evaluating
> decisions on how well they were made rather than on outcome.[7]

Table 1 summarizes this discussion in a simple two-by-two matrix.

Table 1: Process and Outcome Matrix in a Probabilistic Environment

		Outcome	
		Good	*Bad*
Process Used to Make the Decision	*Good*	Deserved Success	Bad Break
	Bad	Dumb Luck	Poetic Justice

From J. Edward Russo and Paul Schoemaker, *Winning Decisions* (New York: Doubleday, 2002),
p.5. Cited in Mauboussin (2004).

Investigating how a company can improve its decision-making process thus
becomes the focus of the remainder of this section. While the probability of
experiencing a "bad break" cannot be eliminated, companies gain power over
the future and reduce the risk of having a bad outcome, somewhat paradoxi-
cally, by embracing decision-making uncertainty and abandoning the illusion
that the future can be controlled or predicted.[8] In addition, steps must be
taken to mitigate the effects of cultural lock-in and other biases. The overriding
theme is that a dramatic reorientation in how decisions are made is required:
from the individual to the team, from the decision maker to the decision-mak-
ing process, and from the executive to the organization.[9]

This investigation consists of five subsections. The first subsection examines
basic considerations for improving the decision-making process involved with
strategic adaptation. The second subsection investigates ways for improving
the decision-making process for the purpose of minimizing financial risk. The
third subsection examines approaches to mitigate cultural-lock. Subsection four
discusses the crucial role senior management must play in leading the process
of strategic adaptation and mitigating cultural lock-in. The section concludes

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7　Michael Mauboussin, Decision-Making for Investors: Theory, Practice and Pitfalls, Legg Mason Funds Man-
agement, Inc., May 24, 2004, p.3.

8　See Spyros Makridakis, Robin Hogarth and Anil Gaba, *Dance With Chance*. Oxford: Oneworld Publications,
2010 and Hugh Courtney, Jane Kirkland and Patrick Viguerie, "Strategy Under Uncertainty," *Harvard Busi-
ness Review* (November-December 1997).

9　Kahneman, D., D. Lovallo, & O. Sibony., "The Big Idea: Before You Make That Big Decision," *Harvard Busi-
ness Review*, June 2001.

with a summary of the discussion (presented in Table 4) based on present-ing an outline of the differences in control between execution and adaptation across a number of dimensions.

1. Basic Considerations for Improving the Decision-Making Process

Information

The processes of execution and adaption require different kinds of infor-mation. Executing strategy consists of both technical and behavioural considerations. In terms of the former, the process of execution involves developing and exploiting the organization's capabilities in such ways as mastering operational details, improving processes, pursuing low-level strategic learning, and updating planning information. With respect to behavioural considerations, execution involves aligning various orga-nizational units, along with motivating the employees within them, to undertake behaviour consistent with the company's strategy. The formal information used to support the key activities involved—analysis, action, alignment, motivation, and accountability—must be reliable, unam-biguous (i.e., closed to alternative interpretations), and linked to value creation (as defined by company strategy).

On the other hand, the process of developing strategies today that will serve the organization tomorrow is based on the following consider-ations: repositioning, reconception, reorientation, and reprioritization. Such considerations require information about future possibilities, information that often lies at the periphery of the organization. The periphery is where the forces of disruption originate—the place where new or existing companies attempt to explore unmet customer needs and/or to develop new capabilities, new technologies, or new ways of doing business.[10] Typically, little or no warning occurs regarding develop-ments on the periphery unless the company makes a deliberate effort to periodically monitor it and to understand the possibilities that may arise. Moreover, in developing peripheral vision, the company must guard against defining its competitive environment too narrowly, something the forces of cultural lock-in work against.

10   Richard Foster and Sarah Kaplan, *Creative Destruction: Why Companies that are Built to Last Underper-form the Market—and How to Successfully Transform Them* (New York: Doubleday), 2001.

Information from the periphery may be characterized in two important ways. First, this information is not transmitted in a standardized or pre-packaged form, which means companies must actively seek and compile it themselves in a process Collins and Morten call "zooming out."[11] Second, this information possesses what Mintzberg calls a "soft underbelly:" it reflects ambiguous signals that must be decoded and interpreted. As a consequence, this information is only suggestive of possibilities, not certainties.[12] George Day and Paul Schoemaker have provided a valuable resource explaining how companies can develop peripheral vision.[13] Their approach involves learning from the present as well as envisioning possible futures through scenario analysis.[14] A summary of their advice is presented in Table 2.

*Table 2: Ways to Develop Peripheral Vision**

Learning from the present	Envisioning new futures
• Seek experts to help the company understand relevant developments (i.e., technology, legislation, societal trends, customer needs). • Focus on key performance metrics suggesting problems ahead (e.g., financial results, customer satisfaction, market share). • What are the mavericks within the organization telling you? • What are dissatisfied and defecting customers telling you? • What are peripheral customers and competitors telling you? What are the new players within and adjacent to your industry doing? • What are post-mortems on lost sales contracts won by competitors telling you? • Is the company ceding low margin business to low-end competitors (a classic disruptive innovation finding)? • What low-end competitors could enter the company's price-sensitive markets?	• What future surprises could really hurt or help the company? • Ask operating managers how they would attack the company if they were a competitor or trying to enter the industry. • What emerging technologies within the next 10 years could change the game (consider solutions that would appeal to present-day non-customers who lack the money, time, or skills to use current products/services)? • Is there an unthinkable scenario? For example, what would happen if the price of oil was $30? What if the price was $200? Would we be adequately prepared if the Canadian government permitted some private health care to exist?

* From George Day and Paul Schoemaker, *Peripheral Vision* (Boston: Harvard Business School Press), 2006.

11   George Day and Paul Schoemaker, *Peripheral Vision* (Boston: Harvard Business School Press), 2006. Jim Collins and Morten Hansen, *Great by Choice: Uncertainty, Chaos, and Luck—Why Some Thrive Despite Them All* (New York: Harper Collins Publishers), 2011.

12   Henry Mintzberg, "Crafting Strategy," *Harvard Business Review* (July-August 1987).

13   George Day and Paul Schoemaker, *Peripheral Vision* (Boston: Harvard Business School Press), 2006.

14   For an additional reference on scenario planning see David Axson, *Scenario planning—Navigating through today's uncertain world*, CMA Management (October 2010).

Participants

Conventional thinking is based on the idea that strategy is something that should only occur at the top of an organization, far removed from the day-to-day, front-line operations. However, the reality is that managers who carry out strategy must also be actively involved in making it, otherwise the solution space is limited to what a handful of people located at the top can imagine.[15] In particular, creating strategy requires a diverse group of people around the decision-making table who possess a variety of knowledge and experience about the organization's capabilities, customers, competitors, products, markets, and technologies. There are three complementary reasons supporting this recommendation.

First, as Roger Martin explains, each functional area representative within the organization brings their own mental model underlying salient factors, motivations, and interpretations of the causal relationships at work. Left to themselves, people within a function are more likely to pursue ideas that are consistent with the status quo. In contrast, involving a diverse group facilitates the consideration of more viewpoints and/or alternative ideas.[16] Additionally, it permits more information regarding developments occurring at the company's periphery to be shared and considered.

The second reason reflects the nature of innovation itself. William Duggan argues that most innovations arise from synthesizing selected elements of different ideas or experiences already in existence and placing them in an entirely new combination that comes about in an "aha" moment.[17] This is in contrast to the commonly held view that breakthrough ideas originate from scratch via some creative leap of thought. Steve Jobs articulates this point:

> Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty because they didn't really do it, they just saw something. It seemed obvious to them after a while. That's because they were able to connect experiences they've had and synthesize new things.[18]

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15 Henry Mintzberg, "Crafting Strategy." *Harvard Business Review* (July-August 1987); Eric Beinhocker and Sarah Kaplan, "Tired of Strategic Planning," *The McKinsey Quarterly*, 2002.

16 Roger Martin, *The Design of Business: Why Design Thinking is the Next Competitive Advantage*. (Boston: Harvard Business Press), 2009.

17 William Duggan, *Strategic Intuition: The Creative Spark in Human Achievement* (New York: Columbia University Press), 2007.

18 Gary Wolf, Interview with Steve Jobs, *Wired*, February 1996, **http://allaboutstevejobs.com/sayings/ stevejobsinterviews/wired96.php**. Accessed July 18, 2013.

As an illustration, consider the following often-cited example about Jobs' encounter with Xerox.[19] More than a decade before the arrival of the Macintosh and Windows PCs, Xerox's research institute (called Xerox PARC) invented the world's first computer and windows-based graphical user interface, Alto. The Alto had a mouse, ethernet networking, and a what-you-see-is-what-you-get text processor. However, in 1973 the personal computer market didn't exist, so other than distributing a few thousand units to universities, Xerox didn't know what to with Alto. As legend has it, in 1979 Steve Jobs visited Xerox PARC, saw the Alto, and incorporated many of Alto's features into the Lisa and Mac computers at Apple. According to Duggan, Xerox's vision was to use the graphical interface in a large machine the size of a refrigerator costing $16,000 that was to be part of an office suite with multiple machines and a printer that, in 1981, would sell for $100,000. Predictably, few were sold. On the other hand, Jobs combined the graphical interface with his knowledge and experience of Apple's small machines, which ultimately led to a product being introduced in 1984 that cost $2500.[20] Based on an excerpt from Robert Cringely's 1996 film entitled *Great Artists Steal*, Duggan provides the following insight into Steve Jobs' creative mind at work:

> I was so blinded by the first thing they [Xerox] showed me which was the graphical user interface. I thought it was the best thing I'd ever seen in my life. Now remember it was very flawed, what we saw was incomplete, they'd done a bunch of things wrong…. Still though the germ of the idea was there and they'd done it very well and within you know ten minutes it was obvious to me that all computers would work like this some day.[21]

The basic point is that strategic creativity, or what Duggan calls strategic intuition, draws on ideas that come from beyond one's own experience by incorporating the work or experiences of others in a manner that connects the dots among the individual pieces of information in a novel way; hence the recommendation for diversity in a decision-making group.

19   This example was described in Dan Tynan, "The 10 Stupidest Tech Company Blunders," **www.techhive. com/article/170337/missed_tech_opportunities.html**. Accessed July 17, 2013.

20   William Duggan, *Strategic Intuition: The Creative Spark in Human Achievement* (New York: Columbia University Press), 2007, p.101.

21   William Duggan, *Strategic Intuition: The Creative Spark in Human Achievement* (New York: Columbia University Press), 2007, p.101.

The third reason supporting diverse decision-making groups comes from the literature on change management. Engaging more employees across the organization not only creates additional creative energy and ideas, it also raises the level of buy-in as more people become involved, resulting in less resistance during the implementation phase of a new idea.

Decision-Making Style

Execution-type decisions involve finding the best solutions to problems facing the organization, many of which occur at a single point in time following a specific "event." This process is characterized by lower level managers examining (historical) facts and combining logic, knowledge, and pre-established tools or techniques (reflecting the dominant mental models in play) to convince higher-level managers that the proposed course of action is correct. Garvin and Roberto refer to this decision-making style as "advocacy," a style based on "convergent thinking."[22]

The decision-making that underlies strategic adaptation, on the other hand, is a much messier affair because it is based on information gathered from the periphery and/or venturing into the unpredictable. It requires "divergent thinking," or what Garvin and Roberto refer to as an "inquiry" style of decision making, whereby the decision-making process unfolds over time based on discussions that serve to broaden management's outlook and/or to reduce risk. The inquiry style of decision making—characterized by observing, reflecting, challenging, debating, sharing, probing, storytelling, and, ultimately, synthesizing—has three uses that makes it absolutely fundamental to the process of strategic adaptation.

The first is to develop "deeper" solutions by creatively eliminating the inherent tensions between competing ideas and integrating the best aspects of each in a fruitful manner.[23] For example, before the Just-In-Time flexible manufacturing philosophy was introduced in North America, contemporary thinking was based on variants of the Economic Order Quantity model. This model assumed there was a necessary economic trade-off between production volumes, which resulted in increased economies (because fixed setup costs were spread over more units) and increased product variety (which would lead to the need to hold more

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22 David Garvin and Michael Roberto, "What You Don't Know About Making Decisions," *Harvard Business Review* (September 2001).

23 See Roger Martin. *The Opposable Mind: Winning through Integrative Thinking.* Boston: Harvard Business Press, 2009.

costly inventories). The assumption giving rise to this trade-off was that set-up times were inviolate. The Japanese challenged this assumption and focused on drastically reducing them so as to permit significantly lower, economic production volumes.[24]

The second purpose of the inquiry style is to subject ideas and assumptions to challenge and debate (e.g., interpreting the strategic meaning of information gathered from the company's periphery). This is an essential requirement in a situation characterized by uncertainty and the use of information that may be incomplete, ambiguous and filtered by cognitive distortions and beliefs.

The inquiry style's third use involves applying the logic of the scientific method to make inferences about important strategic uncertainties.[25] It begins with creating alternatives to the status quo and framing a decision as a *choice* among competing possibilities. This compels decision makers to explore new, creative solutions that help to dislodge cultural lock-in. Following this, the critical assumptions underlying the validity of each alternative (including the status quo) are identified and tested (by acquiring evidence) to the satisfaction of all participants, a step that helps secure increased buy-in to the alternative the group ultimately choses. Moreover, by scrutinizing the status quo, this method serves to counter the tendency to assume, unreflectively, that current results will continue indefinitely, a practice that makes it difficult for new ideas to successfully challenge the status quo.

Table 3 contrasts the differences between the decision-making styles of advocacy and inquiry. Under the latter, it is crucial to assemble a diverse team and manage the debate in a manner that fairly considers each individual's perspective. This also serves to increase the probability of building a consensus for the alternative the team ultimately choses. In contrast, the advocacy approach often sees dominant members treating skepticism as an unwelcome roadblock and participants soon learn not to bother expressing alternative points of view. Finally, the inquiry style is premised on truth being able to speak to power (i.e., establishing a climate that values "what is right" rather than "who is right"). The Black-Berry example discussed in Part I illustrates what happens when this does not occur.

24 Richard Schonberger. *Japanese Manufacturing Techniques* (New York: The Free Press), 1982.

25 See A.G. Lafley, Roger Martin, Jan Rivkin, and Nicolaj Sigglekow, "Bringing Science to the Art of Strategy," *Harvard Business Review* (September 2012).

Table 3: A Comparison of Two Decision-Making Styles*

	Advocacy	**Inquiry**
Purpose	Find the correct answer to a specific problem (e.g., "what should we do?")	Stimulate creative thinking by posing tough questions and soliciting options (e.g., "what might we do?") along with determining the information required to make a good decision
Nature of discussion	A contest: persuasion and lobbying	Competing ideas: models treated as hypotheses rather than as truths, leading to constructive criticism, assumption testing, and evaluation
Time frame	An event: a discrete choice occurring at a single point in time	An unfolding process
Participants	People who "own" the problem	People representing a diversity of specialties, backgrounds, and experiences
Participant's role	Advocate for a specific position (e.g., "what do I believe?")	Generating ideas and following the practice of scientific skepticism (i.e., outlining the specific conditions that must be true for a skeptic to become a believer in a way that can be put to empirical test)
Patterns of behaviour exhibited	• Strive to persuade others • Defend your position • Downplay weaknesses • Asking: "Who is right?"	• Present balanced arguments • Remain open to other people's alternatives • Present and accept constructive criticism and dissent • Create a climate characterized by the idea that "it is not about who is right but what is right" • On important decisions, require empirical evidence to support assumptions crucial to the acceptance of an alternative
Minority views	Discouraged or dismissed	Cultivated or valued
Outcome	Winners and losers selected by the "authority" (i.e., the leader)	An open process featuring organized skepticism, patterned on the scientific method, designed to generate alternatives that are explored and tested collaboratively, resulting in increased buy-in

*Key sources: David Garvin and Michael Roberto, "What You Don't Know About Making Decisions," Harvard Business Review (September 2001) and A.G. Lafley, Roger Martin, Jan Rivkin, and Nicolaj Sigglekow, "Bringing Science to the Art of Strategy," Harvard Business Review (September 2012).

Conducting Post-Mortem Analyses

Because of the complexity of the issues involved and the unique circum-stances of each company, it will take time for a company to develop a good decision-making process. Consequently, management teams should conduct post-mortem analyses after implementing major strategic initia-tives. At a minimum, this review should examine the various dimensions that have been discussed above (e.g., determining if the company used the appropriate information to make its decision, if there were other par-ticipants who should have been involved, if the inquiry style was properly implemented, if any biases existed that could have been avoided, and why resistance to a new idea occurred, etc.). The discussion in the remaining subsections will provide further considerations to incorporate in the review.

2. Developing Robust Strategy

As explained in Part I, companies should develop strategies that are "robust" to alternative states of nature without exposing the company to excessive financial risk. This recommendation involves developing a *portfolio* of individual strategic initiatives combined with the discipline to subject new ideas to an emergent and social process of discovery.

A portfolio of strategies accommodates more potential states of nature, which increases a company's "level of fitness" or flexibility. The discov-ery process, on the other hand, reflects the nature of the evolution of new ideas, increases buy-in, and reduces financial risk following from the implications of Raynor's paradox. A company makes itself increas-ingly vulnerable to this paradox when it "bets the farm" and treats new strategic commitments as all-or-nothing affairs. Instead, like the venture capitalist, companies should consider experimenting and staging capital commitments, where, over time, commitments are built up or abandoned based on the learning that occurs and on how the future unfolds. The next two subsections probe this recommendation further.

Methods for Developing Robust Strategy

Rita Gunther McGrath and Ian MacMillan developed a method, called "discovery-driven planning," that represents an application of the inquiry style based on the scientific method, as discussed earlier.[26] Organizations can use it to root out errors in underlying assumptions involving strategic uncertainty. This method begins with management establishing the financial target a new strategic idea must meet or surpass. The decision-making team then establishes which critical assumptions must prove true for the required target to materialize. These assumptions can include such things as the size of the market, the level of customer acceptance of the product, the price customers will accept, or the ability of the company to achieve certain milestones (e.g., quality, level of service, or cost). Following this, a small-scale experiment or pilot is implemented to obtain evidence on the validity of the critical assumptions. Based on the results obtained, the decision on how best to proceed is taken (i.e., abandon, adopt, or pursue next-stage testing).

By requiring evidence to affirm crucial assumptions, discovery-driven planning represents a dramatic departure from the conventional practice of burying inherent uncertainties into single value estimates (which are likely to be optimistic because of cultural lock-in) and subsequently conducting discounted cash flow analyses based on them. This is a flawed practice when strategic uncertainty is high.[27] Moreover, the smaller initial costs along with the explicit acknowledgement of uncertainty assist in countering the well-documented escalation of commitment bias that narrows a manager's field of vision and makes it difficult to cut losses early.

Using "real options" is another way to think about managing strategic risk. This approach was derived from the use of financial options developed in the field of finance.[28] Finance models of option valuation indicate that the value of any option increases with volatility, making it possible for a company to benefit from uncertainty. The intuition behind real options is that it is valuable for a company to possess increased flexibility in times of uncertainty because it positions the company to cope with and benefit from a wider variety of possible future outcomes. Specifically, for the cost of investing a manageable amount now, real options

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26 See Rita Gunther McGrath and Ian C. MacMillan, "Discovery-Driven Planning," *Harvard Business Review* (July-August 1995) or Rita Gunther McGrath and Ian Macmillan, *Discovery-Driven Growth: A Breakthrough Process to Reduce Risk and Seize Opportunity* (Boston: Harvard Business School Publishing), 2009.

27 Hugh Courtney, Jane Kirkland and Patrick Viguerie. "Strategy Under Uncertainty." *Harvard Business Review* (November-December 1997).

28 See Keith Leslie and Max Michaels, "The real power of options," *The McKinsey Quarterly* 3, 1997; Peter Coy, "Exploiting uncertainty: The 'real-options' revolution in decision-making," *Business Week* (June 6, 1999).

provide companies with the right, but not the obligation, to continue to pursue the opportunity depending on how the future unfolds.[29] In addition, companies can sometimes incorporate the value of this flexibility into its financial analysis (see the box, "Using Real Options in the Motion Picture Business").

The following narrative chronicling events leading to Microsoft's success with Windows was written by Eric Beinhocker, a former McKinsey consultant. By the late 1980s, Microsoft had made a commitment to the computer software industry (i.e., with its operating systems and applications), yet the company had a tremendous amount of strategic uncertainty regarding the specific path it should take within this overall positioning. Beinhocker's narrative describes how Microsoft dealt with this uncertainty by taking out real options in the course of developing a robust strategy.

> In 1988, I was wandering the floor of Comdex, the computer industry's enormous annual trade show and could feel a palpable sense of anxiety among the throngs of participants. Since the birth of the IBM PC six years earlier, Microsoft's DOS operating system had been the de facto standard of the industry, and the stability it had provided had led to explosive growth for the entire industry. But by 1988, DOS was beginning to show its age, and the big buzz on the floor of the show was "Are Microsoft's days numbered?"
>
> Apple, then at the peak of its powers, had one of the largest, fanciest booths at the conference. Its dazzling graphical operating system made DOS look like an antique. Aggressive Sun Microsystems had teamed up with AT&T and Xerox to combat Microsoft with a graphical version of Unix called OpenLook. Across the hall, another powerful group of companies including Hewlett-Packard, Digital Equipment Corporation, Apollo, and Siemens Nixdorf had combined forces in a consortium called the Open Systems Foundation, which was pushing its version of Unix, also with a slick graphical user interface. Meanwhile, IBM was determined not to let Microsoft advance on it again. The highlight of its booth was OS/2, a product in which it had invested heavily, and which it claimed combined DOS compatibility with the power of Unix and the Mac's ease of use.

29   Keith Leslie and Max Michaels, "The real power of options," *The McKinsey Quarterly* 3, 1997; Mark Young, James Gong, and Wim Van der Stede, "Using Real Options to Make Decision in the Motion Picture Industry," *Strategic Finance* (May 2012).

There was something very curious about the Microsoft booth. First, it was by no means the largest or splashiest booth. Microsoft had been quite successful, but was still dwarfed by many of its competitors. More important, the content of the booth was more Middle Eastern bazaar than trade-show booth. In one corner, Microsoft was previewing the second version of its much delayed and much criticized Windows system, which as yet had little significant market share. In another corner, the company was pushing the virtues of its latest release of DOS version 4.0. In yet another area, it was displaying OS/2, which it was co-developing with IBM. And across from OS/2, it was demonstrating major new releases of Word, Excel, and other applications for the Macintosh. Although Microsoft was a distant second to Lotus [the dominant spreadsheet product at the time] and WordPerfect [the dominant word processing product at the time] in DOS applications, it had quickly become the leader in applications for the Mac. Finally, in a back corner, it was showing SCO Unix. SCO was the largest provider of PC-based Unix systems at the time, and Microsoft had entered a marketing agreement with the company and would buy a major stake in it a few months later.

A corporate buyer standing next to me grumbled, "What the hell am I supposed to make out of all of this?" It seemed to sum up the situation. Along with the confused customers, the press was also grumbling. Columnists claimed that Microsoft was adrift and [Bill] Gates had no strategy. The press also reported that tension and infighting inside the company was caused by the fact that groups on one part of [Microsoft's] Redmond campus were furiously working on Windows and DOS, while others down the hall were pouring their energies into OS/2, the Mac and Unix.

The ending to this story is well known, and the success of Windows has helped make Microsoft one of the most valuable companies in the world. But Windows' success was not preordained. Standing on the Comdex floor in 1988, it was far from obvious who would win. But whether it was by intent, instinct, or luck, Bill Gates created a very robust strategy for securing Microsoft's position. Clearly, his preferred outcome was Windows' success, but he could see that this was by no means certain. His strategy was aimed at those uncertainties. If customers wanted evolution in DOS and not revolution with Windows, he could

provide that. If OS/2 won, he would share the wealth with IBM. If the Mac won, he would lose the operating system but win in applications. If Unix won, he would no longer be the major player, but at least with SCO, he could be a contender. In addition to making bets on multiple horses, he also took steps that would pay off no matter what the outcome. So, for instance, he invested heavily in building skills in graphical user interface design and object-oriented programming—two technologies that would be a factor no matter which operating system won.... [Thus, rather than asking] "What [was] Microsoft's strategy?" It makes a lot more sense if we ask, "What [were] Microsoft's strategies?"[30]

Using Real Options in the Motion Picture Business

Young, Gong and Van der Stede provide an example from the motion picture industry (specifically, the treatment of sequel films) to illustrate the value of real options. Sequels, follow-ups to successful original movies, present a low-risk investment option based on the assessment of the original movie's success. Sequels are lower risk because the success of the original movie suggests a favourable connection with established characters and context. Although sequels may be planned during production of the original movie, neither are jointly produced or marketed. The decision to pursue the sequel is always made after the original has proven successful.

Assume the production of an original movie is projected to cost $100 million and is estimated to have a 50/50 chance of either generating discounted cash flows of $10 million or $180 million. This results in a negative Net present value (NPV) of $5 million [(0.5 * 10 + 0.5 * 180) – 100]. Traditional approaches to investment analysis would therefore reject making the original movie. However, if the studio were to consider a sequel as a possibility if the original movie was successful, then real options logic provides a completely different outcome.

Assume the cost of producing the sequel is $110 million and it has a 10% chance of generating $10 million of discounted cash inflows and a 90% chance of generating $170 million of discounted cash inflows. These probabilities reflect the fact that a sequel is lower risk given the information obtained from the original movie. The NPV of the sequel is $44 million [(0.1 * 10 + 0.9 * 170) – 110]. Since there is a 50% chance of the original movie being a success, the value of the growth option embedded in the sequel is $22 million (0.5 * 44). Thus when considering the original movie along with the possibility of a sequel as an option, the logic of a real options analysis leads to an NPV of $17 million on the original movie (22 – 5). In this scenario, the studio would likely proceed with making the original movie. (A proper analysis would, of course, discount the $22 million back to when the original movie starts.) The key point to draw from this example is that, by boiling down all possibilities for the future into a single discrete scenario, traditional approaches do not capture the value inherent in an option. On the other hand, real options analysis rewards the flexibility managers possess in being able to react to new circumstances or information in a manner that limits the downside but allows exposure to the upside.

Source: S. Mark Young, James Gong, and Wim Van der Stede, "Using Real Options to Make Decision in the Motion Picture Industry," *Strategic Finance* (May 2012).

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30 Eric Beinhocker, "Robust Adaptive Strategies," *Sloan Management Review* (Spring 1999), pp.95-96.

The Need to Socially Construct New Ideas Using an Emergent Process of Discovery

New strategic initiatives should be *socially constructed* by a diverse team composed of operationally-focused personnel using an emergent process of discovery. This conclusion is based on the view that putting an idea into action is often more important than deriving the idea itself, for two reasons.[31] First, early on, there will not necessarily be initial agreement on the meaning and/or the implications of a novel idea—even if derived collaboratively within a team—because a number of important uncertainties will inevitably exist (e.g., level of customer acceptance, market size, competitor reactions, capability of the organization to implement the idea, costs involved, and selling price).[32] Second, based on the historical record, successful ideas are often the outcome of having to recast or reconstruct the original notion in ways that could not have been anticipated at the onset.[33] Consequently, companies should subject promising ideas to an heuristic process involving low-cost, pilot tests or taking out real options, and basing further commitments on the learning that occurs or on how the future unfolds. This practice not only reduces the company's exposure to excessive financial risk, it also helps teams converge progressively towards a common view, serving to reduce employees' resistance to change during full-scale implementation.

3. Mitigating Cultural Lock-In

With respect to strategic adaption, control systems need their equivalent of the Roman God Janus (who represented beginnings and transitions). New ideas and ventures face inevitable conflicts and tensions with existing processes, cultural norms, and the pressures associated with a company's dominant business (underling the company's present strategy). Former IBM vice-president of strategy, J. Bruce Harreld, provides a wonderful illustration of this phenomenon of cultural lock-in in the following story—six years after CEO Lou Gerstner arrived on the scene:

> In the early summer of 1999, we had decided to go after a new business area. So in September, there is Lou Gerstner sitting in his office on a sunny afternoon and he sees a line drawn through the

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31 H. Savall and V. Zardet, *Ingénierie Stratégique du Roseau*. Paris, Economica, 2005.

32 See also A.G. Lafley, Roger Martin, Jan Rivkin, and Nicolaj Sigglekow, "Bringing Science to the Art of Strategy," *Harvard Business Review* (September 2012).

33 Amar Bhide, *The Origin and Evolution of New Business* (New York: Oxford University Press), 2000; William Duggan, *Strategic Intuition: The Creative Spark in Human Achievement* (New York: Columbia University Press), 2007.

project on the budget. It turns out that the executive in charge had said, "due to our current cost pressures, we decided to cut back on those activities we decided to invest in in June."

Lou wrote this note, in frustration. "I have had it," he said. "This is a bunch of crap for this big business unit to believe that this little thing is going to have any material impact on their results for June. I want you, you and you [the colleagues who were at the meeting], to understand what's going on here. There is something systematically wrong with IBM and how we manage that we can't embrace and stay with new investments for growth."[34]

Let us now turn our discussion to examining three ways companies can mitigate the effects of cultural lock-in. This examination will look at meetings and meeting sequence, the evaluation of strategic investments, and the need to isolate exploration units from those pursuing "business as usual."

Separate Meetings

When companies combine strategy reviews with financial discussions (e.g., during the preparation of annual operating budgets), short-run financial issues surrounding the company's deliberate strategy inevitably dominate management's attention. This can result from "street" pressures, from the company's current performance evaluation measures, or from awarding incentives connected with meeting specific targets. Overcoming this problem requires separate, demarcated meetings dedicated to each specific purpose: execution (i.e., operations) or adaptation of strategy. Specifically, the process should begin with a discussion of strategy and strategic initiatives followed by separate operating and capital budget meetings that are linked to implementing the strategic decisions the company has made. In this connection, it is important to recognize that a company's *actual* strategy is the product of the resource allocation process (i.e., what gets approved for funding), not simply what gets said at meetings or written about in company documents.[35]

34   J. Bruce Harreld, keynote speech, Strategic Management Society Annual meeting, November 1-4, 2005, Orlando. Cited in Rita Gunther McGrath and Ian Macmillan, Discovery-Driven Growth: A Breakthrough Process to Reduce Risk and Seize Opportunity (Boston: Harvard Business School Publishing), 2009, p.3.

35   Clayton Christensen and Michael Raynor, *The Innovator's Solution* (Boston: Harvard Business School Press), 2003.

Evaluation of Strategic Investments

Traditional evaluation approaches based on measures such as NPV, net income, return on investment (ROI), or earnings per share can create a systematic bias against investing in strategic initiatives. This occurs for two reasons: behavioural (i.e., motivational) and narrow-mindedness (i.e., making decisions without reference to long-term strategic considerations).

With respect to behavioural biases, the use of traditional evaluation measures may discourage managers from recommending new initiatives that are either too small to meaningfully increase short-term profits (as the IBM example above illustrates) or take too long to produce meaningful profits. The problem is that such behaviour ignores the fact that disruptive technologies, products, and business models almost always begin with small markets (i.e., today's non-customers) which, generally, take time to generate substantial revenues. Alternatively, managers may not recommend new investments when the increased depreciation and/or the need to write off assets reduces short-term profitability.

Turning to the second reason of narrow-mindedness, traditional approaches often underestimate the real returns and benefits of investing in innovation because they fail to incorporate the value of strategic flexibility, the ability of these expenditures to open up new or unintended avenues, or the long-term competitive benefits of developing new capabilities. This concern is consistent with two mistakes that established companies make when weighing the decision to invest in a new technology or business in response to a competitive threat.[36] The first mistake is to assume the present health of the company will persist indefinitely if the investment is not made. This assumption is unlikely to be valid if the new investment offers capabilities required for the company's future success. The second mistake is to compare the full cost of the new investment with the marginal costs of the status quo. This practice is based on the logic that the fixed costs associated with the latter are sunk, consistent with relevant cost theory. The problem is that this approach will inevitably lead the company to reject the new investment. Both of these errors have the potential to lock the company into a failing strategy over time.

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36   Clayton Christensen, Stephen Kaufman and Willy Shih, "Innovation Killers: How Financial Tools Destroy Your Capacity to Do New Things," *Harvard Business Review* (January 2008).

There are several ways to circumvent these issues, some of which this paper has already discussed. For example, companies can analyze investments in pilot projects as real options rather than as go-or-no-go projects. Another way is to set budgetary targets that allow for a short-term decrease in profits if the company proceeds with the investment. This protects managers if a new project suffers short-term losses. Alternatively, until a new project becomes fully operational, its financial consequences can be omitted from the financial report of the business unit manager, with the company evaluating the project instead on whether it meets agreed-upon financial and strategic milestones. Finally, rather than assuming current results will continue indefinitely, companies should conduct analyses from the perspective of entrants to a new market by treating the status quo as an alternative and critically determining which approach is most likely to prove successful based on using an inquiry style of decision-making.[37]

Adopting an Ambidextrous Structure

Charles O'Reilly and Michael Tushman argue that a key requirement for managing the tension between strategic execution and adaptation is to establish an ambidextrous structure.[38] An ambidextrous structure involves creating a new organizational unit tasked with exploring a specific innovation that is separated from the established business units within the company. These exploratory units can and should possess their own distinctive processes, structures, and cultures so as to minimize the effects of cultural lock-in. Crucial to this recommendation, however, is that senior management must tightly integrate all units (i.e., established and exploratory).

O'Reilly and Tushman found that companies using ambidextrous structures were, on average, nine times more likely to create breakthrough products and processes than companies using other structural approaches to facilitate innovation (e.g., functional design, cross-functional teams, or unsupported project teams). They explain this dramatic increase in performance as follows: an ambidextrous structure "allows cross-fertilization among units while preventing cross-contamination. The tight coordination at the senior managerial level enables the exploratory units to share important resources from the traditional units—cash,

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37   Clayton Christensen, Stephen Kaufman and Willy Shih, "Innovation Killers: How Financial Tools Destroy Your Capacity to Do New Things," *Harvard Business Review* (January 2008).

38   Charles O'Reilly III and Michael Tushman, "The Ambidextrous Organization," *Harvard Business Review* (April 2004).

talent, expertise, customers, and so on — but the organizational separation ensures that the new units' distinctive processes, structures and cultures are not overwhelmed by the forces of 'business as usual.' At the same time, the established units are shielded from the distractions of launching new businesses; they can continue to focus all their attention and energy on refining their operations, improving their products, and serving their customers."

An ambidextrous structure provides one final advantage: middle-level managers will often proceed with caution if they are forced to deal with considerations of both exploitation and exploration because most people, by nature, are risk-averse. This can lead to the company adopting a lower-than-optimal level of risk. Moreover, if business unit managers face trade-offs in managing the short and long terms, they will tend to favour the former because of incentives that may be attached to reaching short term performance targets. The ambidextrous structure can be used to overcome these concerns provided that senior levels of management (i.e., above the operating or business-unit level) are "involved," as discussed next.[39]

4. The Role of Senior Management

With execution, a typical planning (i.e., budget) meeting consists of lower-level managers presenting plans to higher levels and seeking approval. Here, the senior manager's role is not to generate options; instead, it is to emphasize areas for improvement, to motivate stretch thinking and, more generally, to ensure decisions reflect strategic priorities. Additionally, senior managers monitor performance measurement information and act upon it on an exception basis. For the most part, these activities do not require attention from the highest levels of management except when the subordinate is the business unit head.

On the other hand, the extent and nature of senior management's involvement in facilitating strategic adaptation differs dramatically from execution and is nothing short of crucial, both in terms of mitigating the effects of cultural-lock-in and reducing strategic risk. Several points underlie this conclusion.

39   Michael Raynor, *The Strategy Paradox* (New York: Doubleday), 2007.

First, the only learning that truly counts is by those who have the power to act and impact the resource allocation system.[40] Consequently, senior management must be sufficiently involved so they are intimately aware of their business units' strategic uncertainties and the steps being taken to manage them.

Second, a high level of involvement is required to permit senior management to make an objective assessment of the difficult trade-offs between the present and the future while keeping the organization's overall priorities in mind.[41] Control systems are biased towards measuring short term results and thus it is difficult for operating managers to make such assessments, as previously explained.

Third, senior management must find ways to overcome factors that inhibit business unit managers from pursuing new strategic initiatives. These factors include time constraints, risk aversion, and the often negative impact of new initiatives on the profitability of existing businesses. Ultimately, senior levels of management must decide whether a new initiative warrants establishing a new and separate business unit.

Fourth, senior management must periodically "unfreeze" dominant mental models and lead the process of "zooming out" as an antidote to cultural lock-in. This process requires instilling and modeling an inquiry mode of decision-making permitting divergent thinking to flourish. In particular, senior management must lead discussions with hard questions—rather than with solutions—about the strategic uncertainties facing the company to motivate subordinates to break out of narrow search routines, to stimulate opportunity seeking, and to encourage the emergence of new initiatives.

Fifth, senior management should consider what can go wrong by exhibiting what Collins and Hansen call "productive paranoia:"

> What is the worst-case scenario? What are the consequences of the worst-case scenario? Do we have contingencies in place for the worst-case scenario? What's the upside and what's the downside of

40   Arie de Geus, "Planning as Learning," *Harvard Business Review* (March-April 1988).

41   Charles O'Reilly III and Michael Tushman, "The Ambidextrous Organization," *Harvard Business Review* (April 2004).

this decision? What's the likelihood of the upside and the downside? What's out of our control? How can we minimize our exposure to forces we can't control? What if? What if?[42]

As this passage indicates, productive paranoia reflects senior management's hyper-vigilance or constant worry about potential threats created by an environment in flux. Such a mindset becomes productive — rather than dysfunctional — only when the leader's fears and worries translate into action through the development of contingency plans and maintaining a margin of safety to protect against the unexpected. The crucial point is that every significant source of strategic uncertainty (i.e., risk) must have an initiative that addresses it with people assigned responsibility for its undertaking.[43]

Finally, the CEO must guide and provide perspective for the strategic renewal process and, in the end, be the arbitrator and steward of a living strategy.[44] This requires a deep understanding of how the company currently provides value to customers and it requires looking inside and outside the company for threats and opportunities for adding or recreating customer value. Based on such an understanding, the CEO must establish and relentlessly communicate the context and vision for adapting strategy — one that integrates people and units involved in exploiting the present and exploring the future — so that both types of activities coexist harmoniously.[45]

5. Summary

This completes our discussion of how control systems must change to control and manage the process of strategic adaptation. Table 4 presents a summary of the discussion based on presenting an outline of the differences in control between execution and adaptation.

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42 Jim Collins and Morten Hansen, *Great by Choice: Uncertainty, Chaos, and Luck — Why Some Thrive Despite Them All* (New York: Harper Collins Publishers), 2011, 122-123.

43 Martin Reeves and Mike Deimler, "Adaptability: the New Competitive Advantage," *Harvard Business Review* (July-August 2011).

44 Cynthia Montgomery, "Putting Leadership Back Into Strategy," *Harvard Business Review* (January 2008).

45 Charles O'Reilly III and Michael Tushman, "The Ambidextrous Organization," *Harvard Business Review* (April 2004).

Table 4: Differences in Control Between Exploitation and Exploration[46]

Theme	Exploitation	Exploration (in dynamic environments)
Overall purpose	Used to implement the organization's planned or deliberate strategy	Used to adapt strategies for creating and recreating customer value based on perceived threats or opportunities
Decision context and approach	A best (or better) way to do something exists. Leads to the focus on measuring *outcomes* that reflect operational effectiveness and efficiency matters connected to company strategy for motivating and supporting operational improvements over time	The metaphor of Schrödinger's cat captures the inherent uncertainty often involved in knowing whether and how best to adapt strategy. Rather than attempting to predict the future, steps should be taken to *manage* strategic uncertainty by monitoring strategic uncertainties, developing strategies that are "robust" to alternative states of nature, and improving the decision-making process to reduce errors from bias
Focal point of the decision	The individual or executive decision maker	The team, the decision-making process, and the organization
Participants	Functional area members connected to the specific decision	Employees with diverse experiences, training, and job functions, as well as outsiders who provide information from the periphery
Information used	Routinely collected information that is standardized, reliable, unambiguous, and linked to value creation	Routinely collected information connected to the company's strategic uncertainties, often residing at the periphery of the organization. Some of this information must be compiled from non-standard sources. This information may be incomplete, ambiguous, and filtered by cognitive distortions and beliefs
Decision-making style	Advocacy (motivating convergent thinking). Used to arrive at the "best" solution	Inquiry (motivating divergent thinking). Used to develop "deeper" solutions, interpret non-standard information, challenge assumptions, root out errors, and develop consensus
Performance measures	Financial and operational measures linked to the critical performance variables underlying strategy	Milestones, both strategic and financial; testing of critical assumptions; and degree of learning
Structure	Formal	Adaptive and loose (i.e., processes, structure and culture must fit the new idea); use of an ambidextrous structure to prevent units involved with exploration from being dominated by the "business as usual" thinking of units focused on exploitation

46 Some of the contributions to Table 4 are based on the following sources: Charles O'Reilly III and Michael Tushman, "The Ambidextrous Organization," *Harvard Business Review* (April 2004) and Robert Simons, *Levers of Control: How Managers use Innovative Control Systems to Drive Strategic Renewal* (Boston: Harvard Business School Press), 1995.

Theme	Exploitation	Exploration (in dynamic environments)
Leadership roles	Granting approvals (final decision maker); shining the light on priority areas, motivating stretch thinking, and managing by exception	Integration of mainstream and exploratory units, making trade-off assessments between the short and long runs, establishing the vision and context for adaptation, challenging existing mental models, and leading "productive paranoia"
Connection to Simons' levers of control	Diagnostic system, beliefs system, and ethical boundaries	Beliefs system, mission statement, strategic boundaries, and interactive controls

Managing the Duality Involves a Delicate Balance and Staying True to One's Core

Given this paper's emphasis on strategic adaptation, it is important not to lose sight of the fact that it is the management of a duality — it is not one or the other. If managers are obsessed with either execution or adaptation, they will eventually do more harm than good.[47] Determining the appropriate balance will vary among companies, reflecting such factors as the company's strategy, the life cycle stage of its main products, and the dynamics of the particular industry (i.e., the predictability and malleability of the competitive environment). More research is required, but as a general rule, a company's strategy should only evolve or adapt to accommodate the pace of market change (i.e., no faster, no slower).[48]

Also, a company must not abandon its purpose (i.e., mission), core values and established competencies in the process of adapting strategy. They provide the necessary foundation for recreating customer value in new ways.[49] The pivot in basketball provides a useful analogy: the player must keep one foot planted in the course of changing direction with the other.

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47 Henry Mintzberg, "Crafting Strategy." *Harvard Business Review* (July-August 1987); Eric Beinhocker, "Strategy at the Edge of Chaos," *The McKinsey Quarterly*, (1) 1997.

48 Richard Foster and Sarah Kaplan, *Creative Destruction: Why Companies that are Built to Last Underperform the Market—and How to Successfully Transform Them* (New York: Doubleday), 2001; Michael Raynor, *The Strategy Paradox* (New York: Doubleday), 2007.

49 Jim Collins and Morten Hansen, *Great by Choice: Uncertainty, Chaos, and Luck—Why Some Thrive Despite Them All* (New York: Harper Collins Publishers), 2011; Richard Foster and Sarah Kaplan, *Creative Destruction: Why Companies that are Built to Last Underperform the Market—and How to Successfully Transform Them* (New York: Doubleday), 2001; and Michael Raynor, *The Strategy Paradox* (New York: Doubleday), 2007.
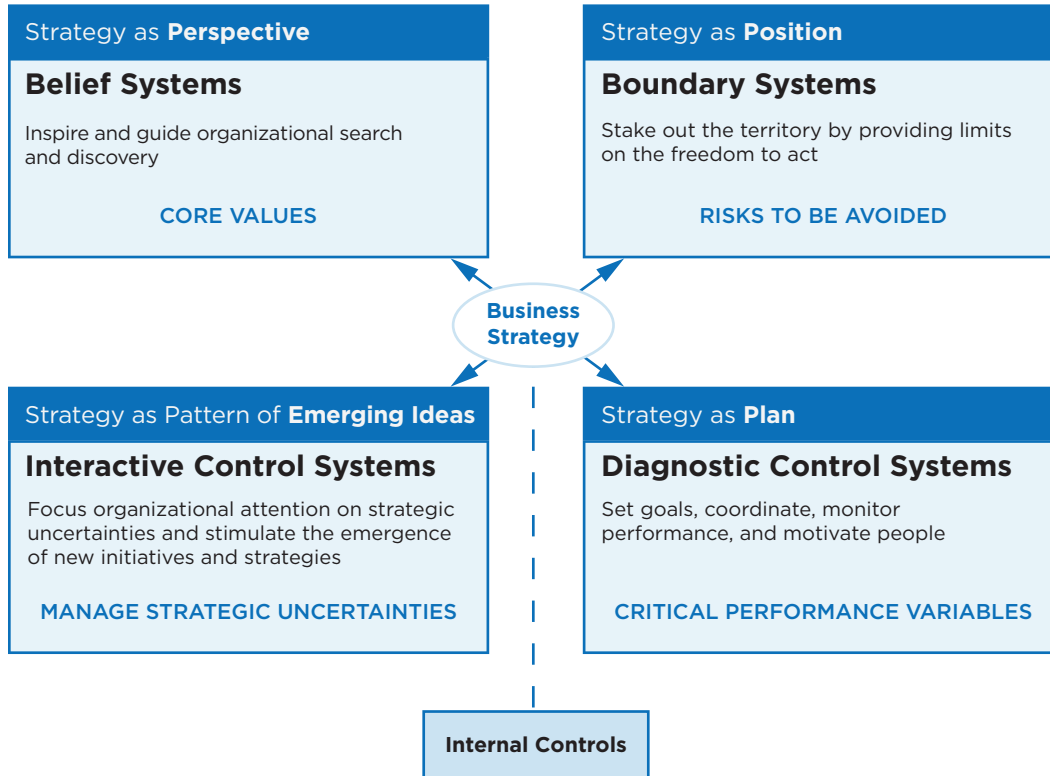
Connection to Robert Simons' Levers of Control Model

Robert Simons' levers of control framework is the only model appearing in the accounting literature that deals with both the execution and adaptation of strategy. It is based on the use of four key constructs—or levers of control—that serve the purposes of exploitation and/or adaptation (see Figure 1):

1. **Beliefs system:** used to frame and inspire the search for new opportunities, communicate core values, and inspire organizational commitment and a shared perspective. Beliefs systems provide the necessary *perspective* to execute and adapt strategy.

2. **Boundary system:** used to define the limits of opportunity-seeking behaviour by outlining strategic boundaries regarding areas or risks the organization will avoid as well as expected standards of ethical conduct. Boundary systems view strategy as a *position*.

3. **Diagnostic system:** used to plan, coordinate, motivate, monitor, and reward the achievement of specified goals consistent with the company's intended strategy. Diagnostic systems view strategy as a *plan* to be implemented.

4. **Interactive system:** used by senior managers to create internal pressure to motivate subordinates to break out of narrow search routines, stimulate opportunity seeking, and encourage the emergence of new strategic initiatives. This lever involves focusing on the company's strategic uncertainties through routinely collected information and debating its meaning among lower and higher levels of management. Interactive systems reflect strategy as a *pattern* of emerging ideas.

Figure 1: Simons' Levers of Control Model*

Strategy as **Perspective**	Strategy as **Position**
Belief Systems	**Boundary Systems**
Inspire and guide organizational search and discovery	Stake out the territory by providing limits on the freedom to act
CORE VALUES	**RISKS TO BE AVOIDED**

Business Strategy

Strategy as Pattern of **Emerging Ideas**	Strategy as **Plan**
Interactive Control Systems	**Diagnostic Control Systems**
Focus organizational attention on strategic uncertainties and stimulate the emergence of new initiatives and strategies	Set goals, coordinate, monitor performance, and motivate people
MANAGE STRATEGIC UNCERTAINTIES	**CRITICAL PERFORMANCE VARIABLES**

Internal Controls

*Robert Simons, *Levers of Control: How Managers use Innovative Control Systems to Drive Strategic Renewal* (Boston: Harvard Business School Press), 1995.

As summarized at the bottom of Table 4, execution activities rely on diagnostic controls along with the beliefs system and the boundaries outlined in a company's ethical code of conduct. Adaptation and exploration activities, on the other hand, are based on empowered employees navigating uncharted territory in the course of developing new strategies that are consistent with the company's core values, mission and risk appetite. The beliefs system and strategic boundaries provide the context for such exploration. In addition, the interactive lever of control, as defined above, motivates adaptation by helping companies detect subtle discontinuities (i.e., new patterns) that may undermine a business in the future. This occurs because the process of regularly collecting

and debating the meaning of information bearing on the company's strategic uncertainties leads to managers possessing "prepared minds" that facilitate the detection of new patterns.[50]

This paper builds upon Simons' seminal work on the importance of monitoring strategic uncertainties and the development of interactive controls for this purpose. Part I aimed to provide insight into the forces impeding strategic adaptation along with how strategy should be managed in dynamic environments. Part II, here, has outlined how control systems must change to effectively address these considerations. These contributions are important because Simons' depiction of the interactive control lever — systematically collecting information on a company's strategic uncertainties (which lower and higher level managers debate) — underplays the key issues impeding strategic adaptation and the need to consider the implications of different levels of strategic uncertainty on the decision-making process.[51] Moreover, his model is incomplete and overly simplistic in describing the nature and type of changes involved for companies operating in dynamic environments. These comments are not meant to be critical. The disciplines of strategy and decision-making have made considerable progress since Simons' valuable pioneering theory was published 20 years ago.

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50 E. Beinhocker and S. Kaplan, Tired of Strategic Planning, *The McKinsey Quarterly*, 2002 (No. 2). Simons' teaching case entitled Codman & Shurtleff can be interpreted in just this fashion. See Robert Simons, Codman & Shurtleff, Harvard Business School Publishing, 1987.

51 Hugh Courtney, Jane Kirkland and Patrick Viguerie. "Strategy Under Uncertainty." *Harvard Business Review* (November-December 1997).

Summary and Conclusion

Conventional views of strategy continue to be rooted in the assumptions of stability and continuity, the validity of which is becoming increasingly tenuous (and dangerous) for companies operating in dynamic markets. Companies should view strategy and its associated planning not only in terms of the present (i.e., "planning today for today"), but also in terms of the future (i.e., "planning today for tomorrow"), which presents a significant challenge for the design of management control systems.[52] Successfully addressing this challenge involves developing two distinct and separate processes, managed in parallel. Such a separation—between the management of uncertainty (adaptation) and the management of commitment (execution)—entails vastly different practices to manage and control each process, culminating in the control architecture presented in Table 4.

It is instructive to abstract the key findings from this analysis for the purpose of summarizing how management control systems can support a shaping strategy, as required in dynamic environments, and mitigate the effects of cultural lock-in, which reflect the two key issues impeding adaptation that were introduced in Part I. Cultural lock-in, while clearly helpful when "zooming-in" on the execution of intended strategy, leads to pressures, mindsets, and control practices that inhibit change, thereby serving to reinforce the status quo. Consequently, senior management should establish a process for periodically assessing and critiquing the dominant assumptions underlying company strategy. Additionally, the decision-making process should reflect an increased awareness of the factors distorting judgment because they inevitably serve to reinforce the status quo.

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52   These terms are from: Derek Abell, "Competing Today While Preparing for Tomorrow," *Sloan Management Review* (Spring 1999).

Overall, the analysis in this paper reveals that these considerations call for the dramatic reorientation of decision making to mitigate bias: from the individual to the team, from the decision maker to the decision-making process, and from the executive to the organization.[53] In addition, control system designers must develop new ways of evaluating strategic alternatives because traditional (i.e., financial) approaches are often biased in favour of maintaining the status quo. Lastly, in some situations, senior management should isolate exploration activities from those aimed at exploiting present-day strategy by means of establishing separate organizational units to prevent each activity from interfering with the other.

Adopting a shaping posture to strategy was also found to have significant ramifications for control. Recall that such a strategy is necessary when a company operates in dynamic environments. The overriding control implication is that companies should focus on developing a superior decision-making *process*. This is the *only* way to increase the odds of success in a probabilistic endeavour (unfortunately, the probability of failure can never be fully eliminated at the level of the individual decision). The upshot is that the decision-making process needs to more fully embrace strategic uncertainty. Methods for acting on this insight include:

- routinely collecting information to assist in monitoring the company's strategic uncertainties followed by interpreting and debating the strategic significance of this information;
- using a decision-making style that promotes divergent thinking, one that roots out errors associated with information that may be incomplete, ambiguous, and filtered by cognitive distortions and beliefs;
- developing strategies that are "robust" (i.e., able to accommodate alternative states of nature without exposing the company to excessive financial risk). In practice, this recommendation involves developing a portfolio of individual strategic initiatives combined with the discipline to subject them to an emergent and social process of discovery; and
- conducting post-mortems on important strategic decisions to improve the decision-making process.

One further finding, reflecting the role senior management plays in strategic adaptation, can be educed from this analysis. Transformational change needs to be socially constructed by a diverse team composed of operationally-focused personnel using an emergent process of discovery that is based on *subjecting new ideas to low-cost experiments and basing further commitments*

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53   Kahneman, D., D. Lovallo, & O. Sibony., "The Big Idea: Before You Make That Big Decision," *Harvard Business Review*, June 2001.

on the learning that occurs or on how the future unfolds; it should not be determined and imposed on the organization by senior management. This recommendation reflects not only the genesis and evolution of innovative ideas, based on the historical record, but it also serves to reduce resistance to change by helping more people converge towards a common view. Senior management's role is to *pilot* the process of strategic adaptation. In particular, senior management—rather than business unit heads—must set the context for adaptation, unfreeze dominant mindsets, manage the difficult trade-offs between the present and the future, engage in "productive paranoia," and bear the risk of pursuing transformational change. This characterization is far removed from the folklore depicting senior management as the architect of company strategy.

In conclusion, it is clear that completely different control systems (consisting of process and structure) are required to manage the duality of execution and adaptation. However, the architecture presented in Table 4 is only a starting point. Few accounting and control exemplars—providing detailed and practical roadmaps—exist describing how companies should facilitate the harmonious coexistence of these two processes. Therefore, detailed case studies need to be conducted to complement and augment the theory contained in this report. Accountants (both practising and academic) have much to contribute to this endeavour, one that, so far, has been dominated by the strategy field. We should not miss this exciting opportunity.