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**EMERGING ELEMENTS OF LEADERSHIP IN A COMPLEX SYSTEM:
A COGNITIVIST APPROACH**

by

Kirsten Suzanne Hanson

A Dissertation Submitted to the Faculty of
San Diego State University and the University of San Diego
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Dissertation Committee:

Johanna S. Hunsaker, Ph.D., University of San Diego
Susan M. Zgliczynski, Ph.D., University of San Diego
Bernard J. Dodge, Ph.D., San Diego State University

May 2007

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by

Kirsten Suzanne Hanson

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DEDICATION

This work is dedicated to my wise and loving parents, Susan and Terry Hanson, who have always inspired me through their example of unconditional love, strength, and commitment. They live true to their values with integrity and kindness and have instilled in me a desire to make a positive contribution in this world. They have given me the “wings” to fly and patiently supported me and believed in me throughout this dissertation process. They embrace life with a strong work ethic and a true sense of joy and laughter. They are a beautiful gift in my life, and I feel so blessed to have my most amazing role models also be my friends.

I further dedicate this work to my caring grandparents, Vivian and Gus Marmesh and Florence and Harold Hanson. Their strength of character, commitment to family, and genuine ways provided the foundation for our entire family to grow and flourish. This work honors them in all that they sacrificed and strived to nurture so that family members would have opportunities and could understand the depths of faith, hope, and love.

I deeply value the influence of my three brothers, Kevin, Ryan, and Bo. Their adventurous and worldly outlook on life, many talents and passion, and generous and thoughtful ways continually touch my life. My brothers are among my best friends and individuals I admire and learn from both personally and professionally. I am grateful for our ever-lasting bond and the joy they bring to my life.

I am appreciative to my sisters-in-law, Lisa and Jenine, for their dedication to family and their enthusiasm about life. I thank them for their genuine ways, kindness, and being interested in what I do.

I am grateful to my close friends and entire extended family including my aunts, uncles, cousins from multiple generations, and especially my godmothers Mary Beth and Marcia. They are all truly kind and loving individuals; I am deeply fortunate to have been surrounded by such love and encouragement my entire life.

Thank you all for your love and support throughout this journey—you are each a blessing in my life.

ABSTRACT OF THE DISSERTATION

Emerging Elements of Leadership in a Complex System:

A Cognitivist Approach

by

Kirsten Suzanne Hanson

Doctor of Education

San Diego State University and the University of San Diego, 2007

As our world grows increasingly complicated at an intensified pace, leaders must be facile managers of complexity if organizations and society are to productively and peacefully evolve. Today's global corporations are microcosms of complexity and have the potential to affect life for almost all other species. However, many organizations have not yet become aware of themselves as "living" and still operate as industrial age institutions with rationalist thinking traditionally dominating management practice.

Many factors impact an organization's overall effectiveness. Yet, executive leaders are seen as having the ability to influence change and play a vital role in helping people navigate ambiguity. The discussion of managing complex systems has increased since complexity theory has become a focus in the natural sciences. Complexity theory is based on principles of being dynamic, self-organizing, and unpredictable but having observable patterns at a macro level; this can help to inform our understanding of complexity in the social sciences. In particular, it is important to understand how the cognitive skills and methods leaders employ contribute to their ability to effectively lead and learn in complexity.

This exploratory study examined how 26 executives at Oracle Corporation function in and observe an actual complex system, while discovering emerging elements and possible leadership guidelines, especially from a cognitive perspective. The Delphi method was employed to examine the study's research questions given the geographically dispersed subjects located in 12 countries. Iterative questioning allowed executives to give meaningful input on theoretical frameworks; the anonymity afforded by the method enabled leaders to freely express their perspectives. Data collected strongly indicated executives are experiencing elements of complexity in their organizations and a clear consensus that a key challenge leaders face is the attracting, retaining, and motivating of employees, especially top talent. Executives also identified 7 essential learning elements and 11 essential communication elements for leaders of complex environments, in addition to 10 essential characteristics or skills for being effective. Findings also included: the most ineffective leadership characteristics, behaviors "actually" observed as compared to those "most effective," worldviews among panel members, and suggestions on learning experiences and optimal time periods to develop future leaders.

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my life, including my entire family and so many friends and mentors, who have touched me in an extraordinary way and given me inspiration and belief in all the goodness that is possible in this world.

CHAPTER 1

INTRODUCTION TO THE STUDY

INTRODUCTION

As our world grows increasingly complex at an intensified pace, leaders must be facile managers of ambiguous, complex organizations and have the ability to effectively live and lead through a significant amount of uncertainty and shifting circumstances. Adept leaders must be prevalent in every environment, yet, at this particular point in history, it is the executive leaders in international corporations that seem to have the greatest potential influence—positive or negative—on the performance and longevity of their own organizations and, maybe more interestingly, on the overall effectiveness of society at large.

An international corporation is a microcosm of complexity and an ideal environment to explore what leaders do or could do to help organizations constructively navigate a dynamic, multicultural, unpredictable existence. They must function in a continual state of “flux,” knowing a slower paced, somewhat ordered (static) environment no longer exists. Executive leaders have developed strategies, mental models, and philosophies and honed specific characteristics and skills that have enabled them to reach positions of authority. The study of such leaders could elicit a deeper understanding of what is effective and ineffective in the emerging world of complexity and what could assist new leaders in this evolving global landscape of leadership.

Leadership studies and numerous leadership books have been written over the years, but complexity theory presents an emerging conceptual framework in which to look at executive leadership in an international corporation. Over the past 30 years, most research on complexity theory has been done in the natural sciences and through the use of computer simulations. There is now an increased interest in the application and relevance of complexity theory to social systems. This study explored this construct within the context of one high technology international corporation, Oracle. This corporation is unarguably defined as operating in a world of complexity (especially given the nature of the software industry); this study provided an uncommon view into the internal leadership behaviors,

especially from a cognitive perspective, that contribute to the functioning of this adaptive environment, making it a rich exploration of how complexity theory may or may not help us to better inform leadership practices in social systems.

STATEMENT OF THE PROBLEM

Complex problems have always existed, so some may ask, “Why is there now an urgency to better understand the role leaders play in effectively navigating such environments?” It is true: There has always been complexity in organizations and in the world. Yet, the pace at which decisions must occur and the numerous factors that must be considered is growing increasingly intense. Modern technologies have afforded us benefits and challenges as the world’s capacity to “produce” only expands.

Arie de Geus (1997), in *The Living Company*, explains the 20th century observed the emergence of a new species on earth: large institutions, especially, global corporations. In *Presence*, Senge, Scharmer, Jaworski, and Flowers (2004) further describe today’s new species of global corporations as

proliferating seemingly without bound, along with the global infrastructures for finance, distribution and supply, and communication they create. This new species’ expansion is affecting life for almost all other species on the planet. Historically, no individual, tribe, or even nation could alter the global climate, destroy thousands of species, or shift the chemical balance of the atmosphere. Yet that is exactly what is happening today. (p. 6)

Once again, many may wonder why this is significant or worrisome given that our organizations and world have constantly evolved and changed through the centuries. Physicist Fritjof Capra (1996) expands upon Lester Brown’s (of the Worldwatch Institute) definition of a sustainable society from an ecological viewpoint, “This is the great challenge of our time: to create sustainable communities—that is to say, social and cultural environments in which we can satisfy our needs and aspirations without diminishing the chances of future generations” (p. 4).

The difficulty of creating sustainable organizations—and a sustainable society—that can operate effectively while facing complex problems that are often ambiguous and unpredictable should not be underestimated. Yet, Senge et al. (2004) assert not only their concern but their hope for this new species of large institutions and global corporations,

like any life form, [it] has the potential to grow, learn, and evolve. But until that potential is activated, industrial age institutions will continue to expand blindly,

unaware of their part in a larger whole or of the consequences of their growth... In short, the basic problem with the new species of global institutions is that they have not yet become aware of themselves as living. Once they do, they can then become a place for the presencing of the whole [not just the parts] as it might be, not just as it has been. (p. 7)

Herein lies the problem: How can global institutions increase their awareness of their role and of the implications of their decisions on employees, customers, consumers, shareholders, and future generations so they and society can become truly sustainable? Further, how can executive leaders effectively lead in complex environments and enable this to happen?

BACKGROUND TO THE STUDY

Oracle Corporation served as the environment for this study and a group of its experienced executive leaders were identified as the subjects. Oracle has more than 55,000 employees worldwide and has offices in more than 140 countries. Oracle's annual revenues are \$15 billion, making it the second largest software company in the world, yet Oracle is the largest "enterprise" software company worldwide. Oracle has completed over 60 acquisitions in the last 10 years, with more than 20 happening in the last 24 months. According to senior executives, Oracle continues to pursue a consolidation strategy in order to meet customer needs and drive shareholder value.

Oracle may not be a household name like Microsoft or Apple because its products are not purchased directly by the consumer. Yet, with products available on hundreds of different computing platforms and installations across the globe, it is likely that almost every businessperson touches Oracle. "When an individual is searching inventory lists, reviewing customer requests, or getting money from an ATM machine, Oracle's relational database is probably at work" (Read, 2000, p. 3). Oracle's CEO, Larry Ellison, is publicly known for being an intense visionary, innovator, and competitor. The company culture is similar and remains somewhat unconventional—being compared to start-up companies by others—when it comes to implementing changes or taking on new challenges. While it has gained some stability, as would be expected in a large corporation of almost 30 years, the constant changes and quick pace inherent in the software industry have required Oracle to remain flexible.

This, in itself, was not a study on Oracle as an organization; rather, it was an exploration of the characteristics and possible common denominators that executive leaders

working within the same complex environment exhibit, possess, and deem as important to being an effective leader. Employment by the same international corporation provided the constant; however, executive leaders selected for this study were diverse in that they reside in various countries and have their own unique life, employment, and personal experiences that have shaped them. It was interesting to explore if there are common elements that diverse executive leaders share when effectively functioning in the same complex environment. This study did not look at policies, business strategy, direction, or common management styles, but rather focused on the complex learning and leadership attributes and expectations of individuals that seem to be effective executive leaders in a complex system.

PURPOSE OF THE STUDY

There are many complex factors that have an impact on an organization's or environment's awareness. Yet, one domain seemed worth exploring in depth as we try to better understand the emerging, increasingly complex situations of the 21 century: leadership.

Given our challenging times, there are deep and growing concerns that our organizations and countries are not developing leaders that have the ability to live and lead with a significant amount of ambiguity and complexity, especially if we are to evolve and live together peacefully. One example is the struggle with the complex problem of terrorism. Terrorism itself illustrates a complex system that relies on networks and unpredictability to accomplish its objectives, and the leadership behaviors needed to address such a complex, new, evolving, and awful problem are not yet fully understood.

Influence comes from multiple levels of an organization. Yet, in most cases, individuals in high-level authority positions are seen as having the greatest ability to influence change, solve problems, and improve situations in an organization or system. Books, journal articles, and studies have been written on the domain of leadership. Well-established researchers and practitioners have written about the "keys" to effective leadership, revealing both provocative insights and common sense solutions. Yet, even with these multiple explanations on how to become an exemplary leader, the essential and intangible characteristics of leaders that effectively navigate complexity seem to elude the majority of executives.

Rationalist thinking in organizations—which focuses on long-term planning, causality, and hierarchical power structures—has dominated management practice since Newton and Descartes. Rationalism is based on the notion that outcomes can be predicted and controlled with the right thinking in place. Yet, managing in complex systems has become a more recent discussion since complexity theory has become a focus in the natural sciences in the last several decades. Complexity theory is based on principles of being dynamic, self-organizing, and unpredictable but having observable patterns at a macro level. With the increased pace at which complex systems are being better identified and understood, the question about how to effectively lead in such systems has been brought to the forefront with heightened interest.

It is difficult to simply define the primary attributes needed for complex leadership, because the extensive amount of literature offers differing conclusions. Yet, for the purposes of this study, this researcher has been greatly informed by the works of Peter Senge and Margaret Wheatley.

Peter Senge (1990) explains how our past models of leadership tend not to be relevant for the times in which we live.

Our traditional view of leaders—as special people who set the direction, make the key decisions, and energize the troops—are deeply rooted in an individualistic and nonsystemic worldview. Especially in the West, leaders are heroes . . . who “rise to the fore” in times of crises . . . So long as such myths prevail, they reinforce a focus on short-term events and charismatic heroes rather than on systemic forces and collective learning. At its heart, the traditional view of leadership is based on assumptions of people’s [follower’s] powerlessness, their lack of personal vision and inability to master the forces of change . . . the new view of leadership in learning organizations centers on subtler and more important tasks. In a learning organization, leaders are designers, stewards, and teachers. They are responsible for “building organizations” where people continually expand their capabilities to understand complexity, clarify vision, and improve shared mental models—that is, they are responsible for learning. (p. 340)

Building upon Senge’s (1990) work, Margaret Wheatley (1999) posits that the contemporary leadership problems organizations face are variations on not knowing how to work together.

We struggle to help teams form quickly and work effectively. We struggle to learn how to work with the uniqueness that we call diversity. We are terrified of the emotions aroused by conflict, loss, and love. In all of these struggles, it is “being human” that creates the problem. We have not yet learned how to be together. I believe we have been kept apart by three primary Western cultural

beliefs: individualism, competition, and a mechanistic worldview. Western culture, even as it continues to influence people everywhere, has not prepared us to work together in this new world of relationships. And we don't even know that we lack these skills. In a simple example of the difficulties created by this ignorance, many MBA graduates who've been in the field a few years report that they wish they had focused more on organizational behavior and people skills while in school. (p. 164)

Senge (1990) and Wheatley (1999) complement one another in their explanations of the type of leadership necessary to address the organizational and societal struggles of today's complex systems. This context will guide the exploration of effective leadership in complexity.

RESEARCH QUESTIONS

It was important to narrow the scope of study to a defined, existing organization and its leaders with the hope that some findings might provide insights that could be used to better understand the implications for the broader society.

1. What elements of complexity theory, if any, do expert leaders observe and experience in a complex organization?
 - 1.1. What stories or critical incidents do leaders use to describe the challenges faced in a complex working environment?
 - 1.2. What stories or critical incidents do expert leaders use to illustrate and describe their complex working environment?
2. What elements or associated behaviors of complexity theory, if any, are expert leaders employing—implicitly or explicitly—in their complex working environment?
 - 2.1. How do leaders approach organizational planning, goal setting, and decision making?
 - 2.2. How do leaders approach changes in their working environment and organizational direction (caused by either internal or external factors) and adjust or not adjust to unexpected outcomes?
 - 2.3. How do leaders describe their personal learning style and information collecting process?
 - 2.4. How do leaders use stories to share information and encourage the exchange of knowledge within their organization?
 - 2.5. What assumptions do leaders make about their complex organizations?
3. What enables certain leaders to effectively guide others through complexity when other leaders are less effective?
 - 3.1. What would be a needed worldview for a leader to be a facile manager of complexity and ambiguity?

- 3.2. How do leaders describe their desire to lead or purpose for leading a complex organization?
4. How do experienced leaders of complexity believe other leaders can learn (or be taught) characteristics or skills to become more effective in complex environments?
 - 4.1. When (at what age, career stage, etc.) do most highly effective leaders tend to develop their skills to manage complexity and when is the optimal time to teach such skills to prepare leaders for effective leading in complexity?

The Delphi method was the methodology used to address the research questions proposed in this study. This study was considered exploratory in nature since complexity theory is still emerging and relatively new in its application to the social sciences, especially leadership. Hence, the Delphi method is a logical approach to begin discovery of executive leader perceptions on how to be effective in complex systems.

LIMITATIONS AND ASSUMPTIONS

This study had two major limitations. First, expert panel participants were limited to Oracle Corporation's executive leaders that are experienced business people employed at the company in the Winter 2006-2007. This limits how the results can be generalized to other environments, but results may possibly be used to inform future research efforts.

Second, researcher bias also needs to be considered when reviewing the findings, as the researcher is employed at Oracle Corporation as a Senior Director managing a global organization. Extra precautions were taken to ensure objectivity in the data analyses, and the researcher checked findings and analysis with individuals not affiliated with Oracle Corporation.

Various assumptions were made in this study. The researcher assumed that the terms effective and complex leadership are positive, desirable descriptors. Also, it was assumed that representation from an international corporation in an inherently complex industry allowed for a general picture of executive leader perceptions in complex systems. Finally, the assumption existed that panel participants took their time to honestly and thoroughly respond to the questionnaires for each round of the Delphi study.

BACKGROUND OF THE RESEARCHER

The background of the researcher contributed to this study and should be acknowledged as a potential source of bias because the researcher is employed at Oracle

Corporation. The researcher has also been exposed to leadership in various capacities: working with numerous executive leaders at Oracle and other organizations, vicariously experiencing many leadership situations as the researcher's father previously served in president and CEO roles at three different companies, and serving in several leadership roles through the years and is currently in the global leadership role for her department. Based on a background in leadership and learning sciences and technology, the researcher believes that a global business and cognition approach to the study of complex leadership could contribute to the practical understanding of complexity's relevance to the social sciences.

DEFINITION OF TERMS

For the purposes of this study, it is useful to be familiar with following terms:

Chaos Theory: It is often used interchangeably with complexity theory, but more accurately, chaos is a particular mode of behavior within complexity.

Complex Adaptive Systems (CAS): Systems that involve numerous interacting, self-organizing agents whose behaviors are to be understood in aggregate, not individually, and have observable patterns only at a macro level. It is primarily used to describe systems in the natural sciences.

Complexity Theory: Generally recognized name for the field of the complex sciences, especially as it is applied to the social sciences. It is a meta-theory, which is essentially a useful way to help humans understand what they are experiencing as living beings in CAS. It is also known as emergence theory.

Emergence Theory: It is synonymous with and interchangeably used with complexity theory.

Learning Organization: An organization that is continually expanding its capacity to create its future, which involves more than just adaptive learning to survive but also generative learning to enhance capacity to create (Senge, 1990).

Randomness: A physics term used to describe the unpredictability of systems—often used before the emergence of complexity theory. A notion that bundles up all unexplained variation and treats it as best captured by probabilities (Rosenhead, 1998).

CHAPTER 2

REVIEW OF THE LITERATURE

INTRODUCTION

An interdisciplinary approach to a review of literature was important to this study to provide support for the application of complexity theory, and the supportive field of cognitive science, to the domain of leadership. Theories and literature from the fields of natural science, social science, business, leadership, cognitive science and psychology, organization development, management, education, and artificial intelligence were reviewed to create an integrated view of how complex systems and their associated behaviors might influence and inform leadership.

This literature review is divided into four sections. Section one provides seminal definitions of CAS and complexity theory as a foundation for understanding how the concept of complexity has relevance to the social sciences and especially the field of leadership. Section two describes the science of cognition at an elemental level and explores how executive leaders might employ various cognitive skills and methods to bring awareness to an organization's tacit knowledge and advance its learning environment and overall effectiveness. Section three considers the possible worldviews that might be perceived by executive leaders and influence leaders' mental models and scripts. Finally, section four explains an emerging convergence of science and spirituality and how complex leadership behaviors might be connected to the meaningfulness of work.

THE MEANING OF COMPLEXITY

Literature from the natural sciences, social sciences, and management genre was reviewed to inform the concept of complexity. Although complexity theory itself is complicated and deserves further research in order for one to be considered well versed, this elemental explanation should be sufficient in providing the strong working definition that is essential for this study.

Understanding in the Natural Sciences

Many scientists viewed the 1980s and 1990s as a time of paradigm shift in science. “Theorists in many fields are moving away from linear, reductionist, simple cause-effect models toward confronting the challenges of complex adaptive systems (CAS)” (Singer, 1995, p. 1). Singer, contributor to the Santa Fe Institute, further explains, “Such systems are found in fields as diverse as astrophysics and quantum mechanics, cellular biology and species evolution, archeology and economics, cerebral neuro-biochemistry and cognitive psychology” (p. 1).

The Santa Fe Institute, founded in 1984 as a private, multidisciplinary graduate research institution focusing on complex systems, has provided much of the leading thinking and writing on the science of complexity. To put it in practical terms, John Holland (1995), computer scientist and engineer and another Santa Fe contributor, explains,

Many of our most troubling long-range problems—trade balances, sustainability, AIDS, genetic defects, mental health, computer viruses—center on certain systems of extraordinary complexity. Despite appearances, the systems that host such problems—economies, ecologies, immune systems, embryos, nervous systems, and computer networks—have enough significant characteristics in common to make it possible, even probable, that common general principles explain their dynamics. (p. 45)

Although many scientists have self-proclaimed they would prefer to use their own nomenclature and descriptions rather than another scientist’s terminology, Holland concisely defines “generally agreed upon principles” that govern all CAS behavior.

Published by the Santa Fe Institute (Holland, 1995), the seven significant characteristics common to all CAS include:

- All CAS consist of large numbers of components, agents, that incessantly interact with each other.
- It is the concerted behavior of these agents, the aggregate behavior, that we must understand, be it an economy’s aggregate productivity, or the immune system’s aggregate ability to distinguish antigen from self.
- The interactions that generate this aggregate behavior are nonlinear, so that the aggregate behavior cannot be derived by simply summing up the behaviors of isolated agents. (More than the sum of its parts)
- The agents in CAS are not only numerous, but also diverse. An ecosystem can contain millions of species melded into a complex web of interactions.
- The diversity of CAS agents is not just a kaleidoscope of accidental patterns; remove one of the agent types and the system reorganizes itself with a cascade of changes, usually “filling in the hole” in the process.

- The diversity evolves, with new niches for interaction emerging, and new kinds of agents filling them. As a result, the aggregate behavior, instead of settling down, exhibits a perpetual novelty, an aspect that bodes ill for standard mathematical approaches.
- CAS agents employ internal models (or schemas) to direct their behavior, an almost diagnostic character. An internal model can be thought of, roughly, as a set of rules that enables an agent to anticipate the consequences of its actions. Even an agent as simple as bacterium employs an “unconscious” internal model when it swims up a glucose gradient in the search for food, while humans make continual prosaic use of internal models, as in our unconscious expectation that room walls are unmoving structures. (pp. 45-46)

It is also worth noting an additional perspective offered beyond the preceding “agreed upon principles.” Holland (1995) further elaborates,

Anticipations based on internal models, even when they are incorrect, may substantially alter the aggregate behavior. And the evolving diversity of agents in a CAS produces a perpetual novelty in dynamics. CAS will certainly remain mysterious until we can take such effects into account. (p. 46)

Although the relevance to leadership will be illuminated upon later in this chapter, this point is of particular interest to this specific study because it is not uncommon, and often likely, that a human’s internal models (schemas) can be incorrect, hence having a greater likelihood of unintended (positive or negative) or misunderstood impact on situations, organizations, and systems.

Understanding in the Social Sciences

While the origin of complexity in the natural sciences is interesting and necessary, it is the intersection with humans in systems and how they choose to interact with, prepare for, react to, and indeed live within complex systems that could provide the most insight to the evolution of life and humanity. Our understanding of the social sciences—the study of society and individual relationships in and to society—can be greatly informed by complexity concepts in the natural sciences, as indicated by the aforementioned scientists.

Complexity theory has come to be the generally recognized name for the field (of which “chaos” is a particular mode of behavior). Yet, as with any derivation from the natural sciences, it is important to use caution when applying complexity concepts to the social sciences realm. Many agree that complexity theory provides helpful analogies and metaphors for deeper understanding of social science phenomena and findings, but it should not necessarily be directly applied. Few studies have been done on its application to human

systems, hence the impetus for this specific study. Yet, given all this, attempting to better understand sociology, psychology, economics, or political science through the lens of such a theory can only further overall domain knowledge and create a type of discourse to deepen understanding of social systems—whether it proves to be a productive or unproductive application.

At a basic level, complexity theory—which is also called emergence theory by scientists—is known as a meta-theory, which is essentially a useful way to help humans understand what they are experiencing. It concerns a new high-level pattern that emerges but the cause and effect can no longer be traced, with a particular focus on novelty, realizing meaning making is not simply determined by the past. And, more attention is placed on the “interaction” rather than the parts. Dr. Michael Shiel, Management Specialist from Ireland, (personal communication, July 17, 2004) provides a mathematical example to further this point. In the simple equation “ $1 + 1 = 2$,” it is the “+” rather than the numerals that hold more meaning and should be studied from a complexity theory perspective. Furthering this example in relation to humans, it is the way they interact, connect, and work together that should be examined to gain more understanding rather than only studying each human as isolated individuals.

This emphasis on “interaction” along with more focus on the aggregate rather than just the parts points to another critical point of complex systems: They are relational. Yet, Wheatley (1999) explains from a social science perspective that humans have difficulty changing and thinking differently about the dynamics of systems.

The organization of a living system bears no resemblance to organization charts. Life uses networks; we [humans] still rely on boxes. But even as we draw our boxes, people are ignoring them and organizing as life does, through networks and relationships . . . the “real organization” will always be a dense network of interdependent relationships. The new [complexity] science keeps reminding us that in this participative universe, nothing living lives alone . . . We are constantly called to be in relationship—to information, people, events, ideas, life. Even reality is created through our participation in relationships . . . we co-create our world. (pp. 144-145)

Once again relying on the connection to nature, Wheatley (1999) relates the “web” of relationship within which people live and work to that of a spider web; it is resilient and if it needs repair, the spider does not abandon it or break it apart; she reweaves it, building

stronger connections. Wheatley claims that biology provides the most critical lesson for changing a living network.

If a system is in trouble, it can be restored to health by connecting it to more of itself. To make a system stronger, we need to create stronger relationships . . . The system is capable of solving its own problems . . . [And] in order to change, the system needs to learn more about itself from itself. (p. 145)

Expanding upon the comparison to biology, Dr. Michael Shiel (personal communication, July 17, 2004) states,

The system doesn't cause anything—it's a concept or construct. As a human, we ourselves are a process; we are a verb, an ongoing process. Just like our bodies are not fixed . . . for example, our stomach lining regenerates every 6 weeks.

So, if social scientists suggest it is our changing human behaviors, interactions, and relationships, and how they all connect to the whole to create the aggregate behavior of the complex system itself, it is useful to pause and revisit the Santa Fe Institute's originally presented seven "generally agreed upon scientific principles" and paraphrase them into human terms to confirm the relevance of the analogies.

In a system where agents (humans) interact incessantly, it is the aggregate behavior—which is nonlinear—we should try to understand. The agents (humans) are numerous and diverse, operating in a complex web of interactions; and the patterns are not accidental because the system reorganizes itself if one agent (human) is removed. The system's aggregate behavior exhibits continual novelty, and the agents (humans) use their internal models or schemas to direct their behaviors.

It seems to make the elemental understanding of complexity theory come full circle. Yet, in *Presence*, Senge et al. (2004) point out, "The fundamental insight of twentieth-century physics has yet to penetrate the social world: relationships are more fundamental than things" (p. 199).

Physicist Fritjof Capra (2002) explains that "at all levels of life, from the metabolic networks inside cells to the food webs of ecosystems and the networks of communications in human societies, the components of living systems are inter-linked in network fashion" (pp. xvi-xvii). Linking further to social systems, Capra (1996) continues,

The more we study the major problems of our time, the more we come to realize that they cannot be understood in isolation. They are systemic problems, which means that they are interconnected and interdependent . . . Not only do our leaders fail to see how different problems are interrelated; they also refuse to recognize how their so-called solutions affect future generations. (pp. 3-4)

Capra (1996) further considers the macro-level social issues and suggests why such situations or conditions may exist by connecting them to human behavior or tendencies, calling attention to ethics and what he labels as “new values” necessary to understanding the world of complexity.

The shift of paradigms require an expansion not only of our perceptions and ways of thinking, but also of our values . . . [There is a] striking connection in the changes between thinking and values. Both may be seen as shifts from self-assertion to integration. (Capra, 1996, p. 9)

Capra (1996) explains the two human tendencies of “self-assertive” and “integrative” in Table 1.

Table 1. Human Tendencies

Thinking		Values	
Self-Assertive	Integrative	Self-Assertive	Integrative
Rational	Intuitive	Expansion	Conservation
Analysis	Synthesis	Competition	Cooperation
Reductionist	Holistic	Quantity	Quality
Linear	Nonlinear	Domination	Partnership

(Capra, 1996, p. 10)

Capra (1996) notes that neither the “self-assertive” or “integrative” tendencies are intrinsically good or bad. Both are needed. It is the imbalance, for example of Western culture, which has overemphasized the “self-assertive” and neglected the “integrative” that is unhealthy. Furthermore, Capra explains that power (domination over others) is excessive self-assertion and is most commonly exerted in a hierarchical social structure controlled mostly by men. Yet, there is another kind of power “that is more appropriate for the new paradigm—power as influence of others. The ideal structure for exerting this type of power is not the hierarchy but the network, which is also the central metaphor of ecology” (Capra, 1996, p. 10).

What Complexity Theory Means to Leadership

Progressing from its origins in the natural sciences to relevance in the social sciences and Capra’s (1996) suggested human tendencies, why—more specifically—should complexity theory be of interest to those in roles of management? Ralph Stacey (2003), an

influential management complexity author, explains that current, dominant management theory and practice tends to have the hallmarks of overrationalist thinking which has dominated since the successes of Newton and Descartes. Faced with increasing complexity and information overload, management can become quite intolerant of ambiguity. Hence, management often defines its tasks as articulating mission, determining strategy, and eliminating deviation. Rosenhead (1998) explains, “Stability is sought as the ultimate bulwark against anxiety, which might otherwise become overwhelming. All of these managerial reflexes . . . are quite counter-productive when viewed from a complexity theory perspective” (p. 5). Discoveries by complexity theorists indicate that the natural world does not even operate in such a rationalist way and many management complexity authors suggest the creative disorder in the universe needs to be embraced by managers (Rosenhead, 1998). Stacey (2001) summarizes the consequences that are meant to turn much of management orthodoxy upside down. A partial list includes:

- Analysis loses its primacy
- Contingency (cause and effect) loses its meaning
- Long-term planning becomes impossible
- Visions become illusions
- Consensus and strong cultures become dangerous
- Statistical relationships become dubious.

Since controlling uncertainty and deciding where an organization is going then become illusive management activities, what can managers learn from complexity theory?

Simply put, the key finding claimed for complexity theory is the “effective unknowability of the future” (Rosenhead, 1998, p. 5). Given this, how learning is fostered in organizations becomes critically important, because seeking stable equilibrium in an inherently unpredictable environment and overvaluing a common culture can lead to failure. Rosenhead further explains that,

If we accept that we can have no idea of the future environment, then long-term planning becomes an irrelevance, if not a hindrance. This absence of any reliable long-term chart makes learning crucially important, and this must be what has been named “double-loop learning.” That is, it is not enough for managers to adjust their behavior in response to feedback on the success of their actions relative to pre-established targets; they also need to reflect on the appropriateness,

in the light of unfolding events, [and on] the assumptions (the mental models) used to setup those actions and targets. (p. 6)

Argyris and Schon (1996) assert that “double-loop learning” is the only way organizational errors in thinking (including possible tacit understanding) can be corrected; organizational norms and values can be adjusted; and people can enter into true dialogue, debate, and learning. Hence, management complexity theorists suggest an organization should operate in a region of “bounded instability”—welcoming disorder as a positive partner; seeking the edge of chaos; and being open to accident, coincidence, and serendipity. This enables creativity and allows an organization to continuously reinvent itself and strategy emerges as the outcome (Rosenhead, 1998).

From the complexity theory perspective, Stacey (2003) also suggests that both “ordinary” and “extraordinary” management are needed in thriving organizations and must coexist, even with an intrinsic tension between the two modes. While *ordinary management* is defined as useful for day-to-day problem solving and involves logical and analytical processing, evaluating choices against goals, rational choice, and cost-effective performance, it has control and shared ideological consensus at its center. Extraordinary management, however, is necessary if an organization is going to be capable of transforming itself in situations of open-ended change. Groups will be self-organizing and paradox will exist. Rosenhead (1998) helps to further explain that directions and assumptions will be informed by analogies and intuitions—without a reliance on hard evidence—and the decision-making process will be political—while still open and democratic in style—as advocates endeavor to persuade others to their point of view.

So, it could be posited that complexity leaders need to have a great capacity for learning and be instrumental in their own and their organization’s learning. It is with that premise the remaining literature analysis and study will focus on multiple aspects essential to a leader’s learning and his or her ability to facilitate dialogue and “[activate] the tacit knowledge and creativity available within the organization” (Rosenhead, 1998, p. 7) in what Stacey (1992) defines as a critical requirement of extraordinary management.

THEORETICAL FRAMEWORK FOR COMPLEX LEARNING

Building upon a working definition—although elemental—of complexity theory presented in the first section, it is important to examine the trait that separates human beings

from all other living organisms: the ability to learn. That is not to say that other animals or bacteria or chemicals do not change or are unable to learn. Of course, they can and do. Yet, the cognitive capacity of human beings is what distinguishes us from any other living organism. That, in itself, illustrates the significance of such a unique behavior that has potential to considerably impact a complex system. And, within the specific context of this study, it is especially important to consider the multiple, complex, interconnected aspects of learning behavior that are most relevant to a person in a position of leadership in a complex system.

Theories and studies from cognitive psychology, cognitive science, business, education, leadership, artificial intelligence, management, and organization development were reviewed to provide an integrated view of the most critical elements of a leader's learning. It might also be posited that a human's innate ability to learn is the key variation in a complex system, which is why the natural sciences provide good metaphors, analogies, and lessons but not exact applications or explanations for complex social systems. So, it seems necessary to examine certain dimensions of a "leading learner" which might not otherwise be emphasized if just studying learning in general, because a leader often has the potential to have a disproportionate—positive or negative—impact on a complex system as compared to some others (although everyone in the system is theoretically learning).

Why Cognitive Psychology Is Important to Leadership

When talking about complex systems, it goes without saying the brain (or mind) is one of the most complex and least understood systems in the human body. Although the science of cognition is still somewhat underdeveloped—as compared to the depths we have been able to learn about other parts of the body and other living systems—it is important to understand some fundamental concepts of cognition and how the human brain processes and retrieves information (including knowledge, memories, emotions, etc.). A cursory scientific review of how people learn will inform how other aspects of learning actually occur in or possibly limit adult leaders.

John Anderson (2000), Professor of Cognitive Science at Carnegie Mellon University, explains, "Cognitive psychology is thus the foundation on which all other social sciences stand, in the same way that physics is the foundation for other physical sciences.

Nonetheless, much social science has developed without a grounding in cognitive psychology” (p. 3). It was realized in only the last 125 years that human cognition could be the subject of scientific study rather than philosophical speculation, while the physical sciences had developed significantly in the previous centuries (Anderson, 2000). And, cognitive psychology was aggressively supplanted by behaviorism—especially in American science—in the first half of the 20th century. So, in reality, modern cognitive psychology (and now cognitive science and neuroscience) has only meaningfully established itself since 1950 and especially in the last 2 decades. Cognitive psychology developed significantly “in response to developments in information theory, artificial intelligence, linguistics, and neuroscience” (Anderson, 2000, p. 12) and after behaviorism was unable to explain practical learner attention and training problems in World War II.

While immaturity in the field serves as a partial explanation for the lack of integration with other social sciences, Anderson (2000) also explains other social science researchers

have managed to find higher-order principles unrelated to cognitive mechanisms to explain the phenomena in which they are interested . . . For instance [in economics], if we understood human decision making better we could understand deviations from the economist’s prescription for “rational decision making.” (pp. 3-4)

Such lack of integration seems quite curious and somewhat inept, limiting the holistic understanding of a field. Personally, this researcher finds such integration to be critical to this specific study of leadership in complexity. Current complexity management authors have contributed significantly to how the lessons of complexity theory have meaning and application to the role of leaders, yet the researcher posits even more progress could be made on complexity’s meaningfulness to leadership if a more integral understanding of a leader’s cognition and internal models (mental models, scripts, etc.) are more fully examined.

The Science of Cognition

Looking at the link between cognition, consciousness, and complexity, leading scientists with the Santa Fe Institute explain there seems to be increasing agreement—although not yet a defining concept—among researchers of human information acquisition and processing (primarily from the fields of cognitive science, psychology, philosophy, and neuroscience). Singer (1995) writes,

We can describe our perceptual, cognitive, and memory functions through the use of sets of rule-following agents such as feature-detectors, working memory structures, schemata, scripts, and plans. These operate, however, within a broader system in which we receive signals and information not only from a consensually agreed upon outside world but also from sources of stimulation within our bodies. (p. 3)

To explore this concept further, Bruer (1995) explains that according to cognitive science,

All humans share the same basic cognitive architecture, although memory capacity and speed of processing may vary among individuals. Differences in our behavior arise from the ways in which our cognitive architectures, including individual differences in those capacities, interact with the environment. (p. 31)

Herein lies an interesting consideration for leaders: a strong cognitive architecture is helpful, yet it is the ways in which one's architecture engages with the outside world that determines overall effectiveness. This might best be understood by looking at the concept of mental model theory (Johnson-Laird, 1983; Johnson-Laird & Steedman, 1978); people often create a mental model of a world that helps them to deductively reason. Yet, Johnson-Laird argues that a great many errors in human reasoning are produced by failures to consider possible explanations of the data of a situation. Anderson (2000) further explains that several other theories also attempt to explain why people make reasoning errors, yet they all share a common assumption: people apply a very specific and concrete interpretation—rather than logic—to a situation. “Rather than reasoning according to formal rules, [humans] build up a specific [mental] model of a situation and determine what is true of that specific situation” (Anderson, 2000, p. 331). Once again, it is important to pause and note how a leader's incorrect mental models are relevant to a CAS. Recall how Holland (1995) elaborates upon the Santa Fe Institute's seven generally agreed upon principles,

Anticipations based on internal models, even when they are incorrect, may substantially alter the aggregate behavior. And the evolving diversity of agents in a CAS produces a perpetual novelty in dynamics. CAS will certainly remain mysterious until we can take such effects into account. (p. 46)

This researcher posits a leader's mental models are a necessary element to understanding how he or she correctly or incorrectly interacts with a complex system; it seems remiss that more studies have not been done with this in mind.

Building upon the concept of cognitive architectures and mental models, other theories help to further explain the complexity of a human's knowledge structures.

Researchers in cognitive science (e.g., Rumelhart & Ortony, 1976) proposed the concept of a

schema, also a concept used in artificial intelligence and computer science. Essentially, schemas are network structures that store a person's knowledge about objects, events, or situations (Bruer, 1995). Schank and Abelson (1977) expanded upon this and proposed versions of event schemas called scripts. "A script is a structure that describes appropriate sequences of events in a particular context" (p. 41). For example, most people have a script for dining at a restaurant. It is important to note that everyone has slightly different scripts, yet there are typical events or components that are generally agreed upon in common scripts. In the case of Schank and Abelson's restaurant script, the stereotypic sequence is entering, ordering, eating, and exiting (Anderson, 2000).

The reliance on a script-based theory means that human understanding is knowledge-based. Hence, if a person is to understand a specific situation, he or she must have previously experienced that situation and recognize the stored pattern. "People need a great deal of knowledge in order to understand. That knowledge can be of two kinds: specific and general. Scripts are intended to account for the specific knowledge that people have. Most of understanding is script-based" (Schank & Abelson, 1977, p. 67). Certainly, people can adapt to situations that they have not previously encountered; however, according to Schank and Abelson's theory, this mental flexibility comes from a more general type of knowledge that underlies scripts called "plans" and "goals." "A plan is intended to be the repository for general information that will connect events that cannot be connected by use of an available script or by standard causal chain expansion" (Schank & Abelson, 1977, p. 70). Essentially, a plan is comprised of general information that describes choices a person has as he or she looks to achieve a goal. "Plans are initiated because of a desire to achieve one or more goals. Certain goals are more far-reaching than others and they require more planning to achieve" (Schank & Abelson, 1977, p. 71). For example, Schank and Abelson give a description of a simple, short-term goal that requires minimal plans:

Mary wanted to cut her steak.

She called to John in the kitchen. (p. 71)

Mary had the goal of satisfying her hunger. Her plans to accomplish this goal involved eating the steak, which she had to cut first, so she wanted John to bring her a knife from the kitchen. Mary could have also accomplished her goal by utilizing an alternative plan of walking into the kitchen to get the knife herself.

An example of a more complex goal and set of plans could be:

John wanted to become a business executive.

He prepared to take the Graduate Management Admission Test (GMAT).

In this scenario, John has to put together a series of plans in order to accomplish his goal of professional achievement. Yet, in order to achieve this larger goal, John must call upon plans that help him realize other goals that will help him attain his larger goal. Alternative plans and goals to accomplish John's professional achievement goal could have included the steps involved with being an entrepreneur and starting his own company. Schank and Abelson posit,

A routinized plan can become a script . . . plans are where scripts come from. They compete for the same role in the understanding process, namely as explanations of sequences of actions that are intended to achieve a goal. The difference is that scripts are specific and plans are general. Both are necessary in any functioning system. (p. 72)

Understanding of such plans, as exemplified in the preceding scenarios, requires inferencing. Most of us would infer that John believes doing well on the GMAT test will allow him to apply, get accepted, and graduate from a university with his Master of Business Administration (MBA). Then, we assume a company will hire him and he will likely grow and increase his responsibilities and job titles. Humans have an extensive capacity to infer and connect concepts to create meaning (Anderson, 2000; Schank & Abelson, 1977). Herein lies a challenge: How can complexity leaders ensure what they have inferred from situations, coworkers, and multiple data sources is accurate, enabling them to determine appropriate decisions and courses of action?

Finally, "themes" are the fourth and final level of knowledge structures in which scripts, plans, and goals are built upon in script-based theory (Schank & Abelson, 1977). Themes help to explain where goals and plans come from, which is especially useful when goals are not explicitly stated and a complex scenario exists.

Themes contain the background information upon which we base our predictions that an individual will have a certain goal. . . If there were no themes, goals would appear as isolated entities without connection to the rest of what is known about a situation. A theme is essentially a generator of related goals. When a theme is identified it makes sense of a person's behavior by providing a prior context for his actions. (Schank & Abelson, 1977, p. 132)

Schank and Abelson also postulate three theme categories: role, interpersonal, and life themes. A role theme is best described as a societal role such as a teacher, waiter, or doctor, in which the person's goals are decided by his or her role. Examples of interpersonal themes include friend, father/son, and colleague. Interpersonal themes can be similar to a role theme; however, they tend to involve a more social or emotional relationship. Thirdly, a life theme explains the general position or intention a person wants in life such as becoming rich, being important, or doing good works. Schank and Abelson describe the difference between a life theme and role theme using the example of a professor. A "good professor" is a life theme because it expresses something about one's ultimate goals and involves many things including knowledge, respect, and student success, whereas the "professor" role theme simply explains the stereotypical activities of professing. Hence, life themes are more important than role themes and carry more value when decisions that involve goal conflict arise. "Understanding a person's life themes means understanding what that person really wants and what he is likely to do to get it. Knowing someone's life themes means knowing that person. Thus life themes are extremely important for understanding" (Schank & Abelson, 1977, p. 146). Life themes include a collection of goals, and it is possible—and quite common—for a person to have many different life themes operating throughout life. However, difficulties can arise when two different life themes are activated at the same time and have opposite requirements. For example, the life theme of ambition and success may appear to be at times in conflict with the life theme of loyalty (personal qualities).

In summary, "a script is understandable as a particular realization of a plan. A plan is sensible only if it leads to some desired goal. And, a goal is understandable if it is part of a larger theme" (Schank & Abelson, 1977, p. 132).

Building upon this theory of knowledge structure, it would be remiss to not acknowledge another important element that influences human understanding and knowledge: emotions. There is not a common origin for the "emotion" facility in the human brain. Neuroscience explains that the phenomenon we call emotions is located in many systems in the brain. Carter (1998) explains,

Brain systems that generate emotional behaviors are rooted deep in our evolutionary past . . . emotional responses are for the most part generated unconsciously . . . Emotions are things that happen to us rather than things we make happen . . . Our conscious control over emotions is weak, and feelings often

push out thinking, whereas thinking fights a mainly losing battle to banish emotions. This is because the wiring of the brain favors emotion—the connections from the emotional systems to the cognitive systems are stronger than the connections that run the other way [from the cortex to the limbic system]. (p. 98)

Singer (1995), from the Santa Fe Institute, expands upon this further,

Our various information-processing agents confronted with the varied sources of external, body-machinery and centrally generated signals almost certainly operate in a parallel nonlinear fashion in filtering cues and shifting attention. Sudden environmental changes, sudden recurrent stressful memories, or the awareness of unfinished tasks may all compete simultaneously for attention, reflection, and action. My emphasis on this complexity points the way also to still another morphologically distinct system, our emotions. These can be aroused either through cognition or, as is increasingly clear, they may also follow the separate pathways of pure conditioned responses . . . Despite their distinctive and differentiated physiological and psychological properties, however, the emotions are subtly interwoven with [human] information processing. While they can be evoked by pure associative conditioning, they are also largely responsive to interruptions and mismatches in our ongoing efforts to organize and to integrate information from . . . signal sources into meaningful schemata drawn from working and long-term memory. (p. 4)

Hence, it seems entirely appropriate for Dr. Michael Shiel (personal communication, July 17, 2004) to poignantly suggest, “Leaders in complexity need a certain amount of emotional resilience as well as intellectual capacity.” This is not surprising given the impact—from a purely scientific perspective—that emotions can have on a person’s behavior. It seems important to understand how a leader’s emotional stability may influence his or her knowledge structures and overall ability to lead.

So, how can this overlapping research in cognitive science and artificial intelligence be helpful to understanding leaders in complex systems? This researcher posits an understanding of cognitive architecture can provide insight into the common scripts, plans, goals, themes, and/or emotions that most often impact a leader’s decisions and actions. Then, the question becomes how adaptable are the cognitive architectures of these leaders?

Adaptability

“The human mind is a particularly interesting device that displays remarkable adaptiveness and intelligence” (Anderson, 2000, p. 2). Few would dispute this claim that is strongly supported by cognitive science research, yet it is curious why so many people resist or have difficulty embracing change. Wheatley (1999) asserts that people tend not to

work with the forces of change. We act quite the opposite; we need to manage change and keep it under control every cautious step of the way. And we think we're being helpful to others when we manage change so carefully, because we believe that people don't like change. Strangely, we assert that it's a particular characteristic of the human species to resist change . . . even though we're surrounded by tens of millions of other species that demonstrate wonderful capacities to grow, adapt, and change. (p. 138)

So, if science explains humans have the capacity for change, it could be posited that the individual person makes the choice or has control over whether or not this change capacity is used. Yet, this researcher posits "free choice" can also be considered from a scientific perspective. Based on our understanding of the knowledge structures previously described, people often tend to default to the scripts or plans with which they are most comfortable when placed in ambiguous situations. "Understanding then, is a process by which people match what they see and hear to pre-stored groupings of actions that they have already experienced. New information is understood in terms of old information" (Schank & Abelson, 1977, p. 67). Hence, many rely on stereotypes, judgments, and previous experiences without truly assessing a novel situation. These methods give the brain efficiency and provide structure and definition, making the unknown become familiar. In general, people feel more comfort when things are familiar, but it does not necessarily mean their understanding of the situation is entirely accurate.

As discussed, Schank and Abelson (1977) explain that humans rely on scripts or plans (along with goals and themes) to process information more efficiently and function in the world at a basic level. However, when these scripts are interrupted or result in what Schank and Abelson call an "expectation failure" (something unexpected happens in a familiar routine or script), people may feel emotional distress as they struggle to create a new script to navigate through an unknown situation. While the emotions sometimes created with the unknown are not always desirable, it does present an opportune time for learning (creation of new scripts or plans). When this happens, if a person is open to learning, it can be indexed properly in the human mind and put into context, giving the person an increased likelihood of retention and future application of the newly acquired knowledge.

In *Tell Me a Story*, Schank (1990) further explains that clever indexing is critical to creativity, intelligence, and adaptability.

When a prior experience is indexed cleverly, we can call it to mind to help us understand a current situation. This process can lead to brand-new insights . . .

The mind depends upon data in order to give it something to reflect upon . . . Of course, movies, books, newspapers, and television provide much of this data. But in many ways the most important data we have comes from within. We learn from reconsidering experiences we have already had in light of new information. We form insights by comparing what we are currently examining with what we have already examined. To do this effectively, we had to have been very clever in how we labeled the data we originally perceived so we can find it again in circumstances that we could not have anticipated initially. (Schank, 1990, pp. 9-10)

Yet, given this understanding of knowledge structures and indexing, this researcher is led to ask, “Are leaders more effective in navigating complexity when they know more or less about a chosen domain?” This researcher posits knowledge is always important and helpful when leading an organization, yet it is necessary for leaders to be aware of how reliant they are on their own knowledge so as not to become too dominant or controlling in their behaviors. Ronald Heifetz (1994) asserts,

In a crisis we tend to look for the wrong kind of leadership. We call for someone with answers, decision, strength, and a map of the future, someone who knows where we ought to be going—in short, someone who can make hard problems simple . . . Instead of looking for saviors, we should be calling for leadership that will challenge us to face problems for which there are no simple, painless solutions—problems that require us to learn new ways. (p. 2)

Inevitably, in today’s complex world, it is impossible for a leader to have the comprehensive knowledge necessary to make a major decision unilaterally. Yet, herein lie two challenges. First, team members or citizens, essentially followers of the leader, need to accept a script for active involvement in determining a course of action. Second, leaders need to be open to script changes and learning from sources (people) that they may not have interacted with previously.

So, could it be the case that a leader’s adaptability and capacity to index information that is useful in complexity might depend on his or her themes—which underlie his or her goals, plans, and scripts? For example, is a leader with the life theme of “having power” more, less, or equally adaptable than a leader with a life theme of “doing good works?” Of course, the origin of a person’s themes incites more questions than can be explicitly explored in this study. Yet, it could prove insightful to better understand the similar or dissimilar mental constructs with which complexity leaders operate. Further examination could also inform how we might better prepare and educate future leaders to develop numerous scripts

and the flexibility and resilience to easily adjust their thinking and learning in a complex system.

Awareness

It is useful to have an elemental understanding of knowledge structures and why or how leaders should be adaptive. Yet, if one is to realize how this is helpful to becoming an effective leader, one must first be aware of one's own learning. Regardless of a leader's specific scripts or mental models of how to function in the world, this researcher would posit that a leader's level of awareness is among the most critical characteristics in determining overall effectiveness in complexity. Two aspects of learner awareness will be considered: metacognition and the "U Theory" (Senge et al., 2004).

Cognitive scientists introduced the notion of metacognition around 1980. It has been defined as "the ability to think about thinking, to be consciously aware of oneself as a problem solver, and to monitor and control one's mental processing" (Bruer, 1995, p. 67). Metacognition has also been described as the fourth and highest level of mental activity which has the knowledge, awareness, and control of the three lower levels: (1) hard-wired basic processes; (2) recall and having sufficient schemas (or scripts) and facts to be culturally literate, for example, knowing $8 \times 7 = 56$; and (3) the conscious use of weak or strong strategies for learning, such as silently repeating a phone number to keep it active in working memory or applying a physics law to solve a problem. Essentially, metacognition is the conscious awareness of ourselves (and, therefore, others) as problem solvers (Flavell & Wellman, 1977). Not surprisingly, research on metacognition indicates that awareness, knowledge, and control of mental abilities develop with age and experience (Bruer, 1995). Such awareness also enables learners to understand the process they went through in order to gain knowledge so they can apply the same critical thinking skills to other domains. This can increase a learner's capacity for effective problem solving in unfamiliar subjects and situations, which can be especially important for leaders.

In addition to a leader's self-awareness about his or her own mental processing and problem solving, it seems essential for a leader to also look outward and become aware of the learning that is occurring in his or her organization. Senge et al. (2004) suggest in *Presence* that most businesses, governments, schools, and other large organizations have a limited type

of learning take place: reactive learning. People rely on habitual ways of thinking (e.g., scripts or mental models) and continue to see the world within the familiar categories that give comfort.

We discount interpretations and options for action that are different from those we know and trust. We act to defend our interests [because of the instinctual behaviors programmed from the reptilian brain stem]. In reactive learning, our actions are actually reenacted habits, and we invariably end up reinforcing pre-established mental models . . . At best, we get better at what we have always done. We remain secure in the cocoon of our own worldview, isolated from the larger world. (Senge et al., 2004, p. 8)

Yet, Senge et al. (2004) assert that deeper levels of learning are possible and the difference is in the depth of the awareness and the resulting actions that serve more of the emerging whole. It is a type of learning where the future becomes more active, building upon John Dewey's (1938) notion that we learn from the past through cycles of action and reflection that lead to new action (which involves stages of observing, discovering, inventing new actions, and producing those actions). Senge et al. propose a new theory

using the image of a "U" to distinguish different depths of perceiving reality and different levels of action that follow from that . . . the process entails three major stages or elements: "Observe, observe, observe"—become one with the world; "retreat and reflect"—allow the inner knowledge to emerge; "act swiftly, with a natural flow." We have come to call these sensing, presencing, and realizing. (p. 87)

The authors are aware that the U Theory may have superficial resemblance to other change management concepts, but there are critical differences they call attention to. In the sensing stage (illustrated at the top left side of the U), they emphasize the importance of suspending one's own bias (not relying on one's comfortable scripts or mental models) and focusing on what is happening from within a situation or phenomenon, rather than from the outside. As previously discussed, this is where most organizations and individuals tend to get stuck; they habitually rely on their preestablished mental frameworks. The next stage of presencing (located at the bottom of the U) is about "seeing from the deepest source and becoming a vehicle for that source" (Senge et al., 2004, p. 89). The authors define presence as

deep listening, being open beyond one's preconceptions and historical ways of making sense. We came to see the importance of letting go of old identities and the need to control and [instead] making choices to serve the evolution of life. (Senge et al., 2004, p. 11)

The authors acknowledge that many spiritual traditions around the world for thousands of years recognize such awareness as being central to personal cultivation and maturation, yet they explain little has been written about this awareness shift as collective phenomenon or about collectively cultivating the capacity for such awareness (or presencing). Finally, the third stage of realizing (moving up the right side of the U)

involves bringing something new into reality, just as in the standard model of learning—but this action comes from a source that's deeper than the rational mind . . . the ability to act in a natural flow . . . as if I'm watching myself in action. I'm both engaged and simultaneously detached. (Senge et al., 2004, p. 91)

The authors also emphasize such action does not involve imposing one's will on a situation but rather feeling connected to others and the world with a sense of cocreation. Based on the U Theory framework, let us try to apply a brief example. This researcher is cognizant that the choice of literature being reviewed for this specific study on complexity leaders is influencing the focus of the study. Of course, it is impossible to proceed in any other way because we know from research in situated cognition (Brown, Collins, & Duguid, 1989) that knowledge itself is subjective not objective and is always embedded within a particular context which is always open to reinterpretation. Hence, it is essential for this researcher to strive to carefully observe, reflect, and act upon the subjects' feedback and be open to other literature, such as culture, that may need to be reviewed in order to cocreate a more accurate understanding of what makes leaders effective in complex systems.

It is interesting to consider how leaders with such awareness—from both a metacognition and U Theory perspective—would function in a complex environment. At what levels of awareness are leaders currently functioning? How likely is it for leaders to have such depth of awareness given the demanding pace they must endure? Or, can such awareness enable a greater ease of operation? Of course, such awareness behaviors could be challenging to employ but could prove beneficial when leaders look to guide the learning of their organizations.

Sharing Knowledge

The concept of a learning organization (e.g., Argyris & Schon, 1996; de Geus, 1997; Senge, 1990) has become part of the vernacular of organization development researchers and practitioners. Considerable research has been done to present a compelling case for why a company should cultivate an environment which views itself as a living organism,

continually learning, evolving, and creating its future by challenging its assumptions, norms, and mental models (or scripts) of both the parts and the whole of the system. Yet, even if leaders “buy in” to this concept and are personally comfortable with complexity, there is often a disconnect with team members (subordinates) who have been conditioned in more traditional or rationalist ways of operating. From a cognitive psychology perspective, it seems interesting to examine what complexity leaders could do or may currently be doing to help their organizations learn and even embrace complexity and ambiguity.

Organizational learning is essential because tacit knowledge permeates an organization. In order for employees to have a shared understanding that can be challenged and expanded upon, it is important to make tacit understanding—which often comes from the leader—explicit, so knowledge can be transferred and applied to multiple domains to increase an organization’s overall awareness and capacity.

The problems with mental models lie not in whether they are right or wrong—by definition, all models are simplifications. The problems with mental models arise when the models are tacit—when they exist below the level of awareness. [For example,] the Detroit automakers [in the 1980s] didn’t say, “We have a mental model that all people care about is styling.” They said, “All people care about is styling.” Because they remained unaware of their mental models, the models remained unchanged. As the world changed, a gap widened between Detroit’s mental models and reality [Japan automakers educating American consumers on the benefits of quality and style], leading to counterproductive actions. (Senge, 1990, p. 176)

Further, in an example of a common struggle in organizational learning, Argyris and Schon (1996) explain, “The managers must discover that it is the norm for predictable management which they hold, perhaps tacitly, that conflicts with their wish to achieve corporate growth through technological innovation” (p. 23). It also seems relevant to pause and consider the complexity section of literature previously discussed, recalling that “[activating] the tacit knowledge and creativity available within the organization” (Rosenhead, 1998, p. 7) is a critical requirement of what is defined as extraordinary management (Stacey, 1992).

Another significant challenge in any educational environment—including international corporations—is to scaffold (or support) a novice as he or she acquires knowledge and guide him or her to expert-level understanding. Experts—who are often promoted into leadership roles—are often unable to explain why they did what they did, because they are not metacognitively aware of their problem-solving process. Hence, experts

are not usually strong teachers because they have gained a certain amount of automaticity (Anderson, 2000; Bruer, 1995); it comes naturally and they no longer consciously think about it. So, the question becomes how can leaders help themselves and their organizations make implicit knowledge explicit?

Storytelling is a useful method for both leaders and subordinates to consciously construct knowledge, hence increasing the likelihood of retention, recall, and activation (Anderson, 2000) and allowing for misunderstandings in scripts or mental models to be addressed. In *Tell Me a Story*, Roger Schank (1990) explains the human mind has difficulty remembering abstractions and that stories are more meaningful for memory and can greatly enhance the quality of learning. Anderson also asserts a similar concept of elaborate processing—which involves embellishing an item with additional context so it is more easily remembered—can facilitate explicit memories, allowing for greater recall and the increased ability to explain why something is the way it is.

A story is useful because it comes with many indices. These indices may be locations, attitudes, quandaries, decisions, conclusions, or whatever. The more indices we have for a story that is being told, the more places it can reside in memory. Consequently, we are more likely to remember a story and to relate it to experiences already in memory. (Schank, 1990, p. 11)

Based on insight from artificial intelligence, Schank (1990) also asserts,

Humans are not really set up to understand logic . . . The reason that people like to hear stories, however, is not transparent to them. People need a context to help them relate what they have learned to what they already know. We understand events in terms of events we have already understood. When a decision-making heuristic, or rule of thumb, is presented to us without a context, we cannot decide the validity of the rule we have heard, nor do we know where to store this rule in our memories. Thus, what we are presented is both difficult to evaluate and difficult to remember, making it virtually useless. People who fail to couch what they have to say in memorable stories will have their rules fall on deaf ears despite their best intentions and despite the best intentions of their listeners. A good teacher is not one who explains things correctly but one who couches explanations in a memorable (i.e., an interesting) format. (p. 15)

This researcher is curious to know how many leaders understand the significance of storytelling and good teaching. Indeed, it seems particularly relevant for this study on executive leaders working in an inherently complex software industry, because the leaders are constantly required to explain a myriad of topics to employees and customers.

The importance stories can have to leaders is further illustrated in Howard Gardner's (1995) *Leading Minds*. Gardner studied 11 significant 20th-century leaders from a variety of domains—including Margaret Mead, Pope John XXIII, Robert Oppenheimer, and Martin Luther King, Jr.—from a cognitive perspective. According to Gardner, the main premise that links these leaders is their stories.

Leaders achieve their effectiveness chiefly through the stories they relate. Here, I use the term *relate* rather than *tell* because presenting a story in words is but one way to communicate . . . leaders in the arts characteristically inspire others . . . by the phrases of a sonata or the gestures of a dance; scientists lead through the manipulation of the symbol systems favored in their domains . . . In addition to communicating stories, leaders embody those stories . . . [the leaders] arrived at a story that worked for them and, ultimately, for others as well. They told stories—in so many words—about themselves and their groups, about where they were coming from and where they were headed, and what was to be feared, struggled against, and dreamed about. (Gardner, 1995, pp. 9-14)

Essentially, stories can provide scaffolding (Bruer, 1995)—or support—for learning in organizations and enable leaders to better articulate their thinking. It would be interesting to learn how often and what types of stories leaders in complex systems tell to share knowledge and build organizational capacity. Based on extensive observation, this researcher posits that many leaders view organizational learning as a “nice” thing to do and do not fully comprehend their essential role in facilitating learning as a means toward attaining sustainable and high performing business results. In *Leadership Without Easy Answers*, Heifetz (1994) declares,

Leadership means engaging people to make progress on the adaptive problems they face. Because making progress on adaptive problems requires learning, the task of leadership consists of choreographing and directing learning processes in an organization or community. Progress often demands new ideas and innovation . . . it often demands changes in people's attitudes and behaviors. Adaptive work consists of the process of discovering and making those changes. Leadership, with or without [formal] authority, requires an educative strategy. (p. 187)

WORLDVIEW OF A LEADER

An increased understanding of how the mind works could help inform our understanding of how social structures and organizations actually operate and evolve. For example, we might be at a point in history where there is a paradigm shift in social organizations from hierarchies to networks (Capra, 1996). It may be coincidental, but it is somewhat interesting to note that the human brain is filled with 100 billion neurons that are

connected through neural networks (Carter, 1998), and more and more we are finding that natural and social systems—as previously described—effectively operate in networks. After all, it is the human mind that constructs the very institutions and society in which we live. Maybe the more we know about ourselves, the more we will learn about our organizations.

In Gardner's (1995) review of the 11 significant leaders of the 20th century, he claims,

Our understanding of the nature and processes of leadership is most likely to be enhanced as we come to understand better the arena in which leadership necessarily occurs—namely, the human mind . . . By focusing on the mind and invoking the word cognitive, I make deliberate contact with an approach to the study of the mind that has developed rapidly in the last few decades. (p. 15)

Gardner purposely contrasts his work with behaviorists, psychoanalysts, and other social scientific literature on leadership, which he groups into four categories: power, policies, public (or audience), and personality. Gardner asseverates his approach to leadership

is cognitive in a generic sense . . . [it] emphasizes a set of considerations that has received short shrift in the otherwise-ample social-scientific literature on leadership [in the four categories] . . . each of which is worthy of consideration, but each of which can be enriched by a consideration of cognitive dimensions. (p. 16)

This researcher agrees with Gardner and posits that further leadership research from a cognitivist approach is needed as complexity increasingly permeates are understanding of systems.

While the critical need for a cognitive understanding has been emphasized, it is equally important to acknowledge that a leader's cultural experiences can fundamentally shape his or her worldview (or, as previously defined, his or her mental models or themes). As Gardner (1995) further explains,

Human beings are cultural creatures, growing up in societies formed over the centuries by other human beings, and participating more or less energetically in institutions that have evolved over equally long periods . . . I apply a perspective that is cognitive as well as cultural. I view leadership as a process that occurs within the minds of individuals who live in a culture—a process that entails the capacities to create stories, to understand and evaluate these stories, and to appreciate the struggle among stories. (p. 22)

Most international corporations, and for that matter civilized societies or democracies, have been greatly influenced by Western philosophy. Some studies have shown, even when individuals work for an organization that is located in a country different than their native

country, they are more influenced by the predominant culture of the organization than by their native culture. In this specific study, the subjects reside in various countries but are employed by Oracle, which is an American-headquartered company.

Given this, there seems to be a useful question for leaders—especially Western-influenced leaders—to reflect upon: How do I look at the world? It is interesting to consider if leaders have more mechanistic or holistic worldviews. Or, in other words, do they have a more controlled and rational or dynamic and complex understanding of how things function? Even though complexity was defined from the natural and social science perspectives in the previous section, it is helpful to revisit it from the context of a worldview and in contrast to rationalist thinking that tends to dominate most corporate environments.

A leader's worldview influences how he or she views his or her environment and learning and leading in complexity. Informed by the Santa Fe Institute, Capra (1996), Senge (1990), de Geus (1997), Stacey (2001), Wheatley (1999), Senge et al. (2004), Capra (2002), and Olson and Eoyang (2001), a simple worldview comparison of rationalist and complexity characteristics is presented in Table 2.

Table 2. Worldviews

Rationalism	Complexity
Causality	Dynamical
Predictability	Nonlinearity
Application of reason	Coherent novelty (meaning making)
Unchanging environment	General patterns at a macro level
Heroic leader emerges in crisis	Relational
Leader seen as symbol of control	Employees willingly participate
Followers attribute power to leader	Dialogue and interaction
Reliable data	Reflection in action
Hierarchical	Complex learning and meaning schemas

As described in Chapter 1, Senge (1990) and Wheatley (1999) give complimentary descriptions of how Western philosophy—traditionally comprised of rationalist thinking—has dominated and seems to currently impede overall organizational advancement. From an

economic perspective, de Geus (1997) reminds us, “Basic economic theory tells us that there have always been three key sources of wealth: land and natural resources, capital (and the accumulation and reinvestment of possessions), and labor” (p. 16). He explains the historical economic shifts that have taken place through the centuries and elaborates,

Sometime over the course of the twentieth century, the Western nations moved out of the age of capital, however, and into the age of knowledge. Few managers recognized it at the time, but capital was losing its scarcity. After the Second World War, an enormous capital accumulation began. Individuals and banks and companies became much more resilient. Technology also began to change, thanks to telecommunications, television, computers, and commercial air travel, with the effect of making capital far more fungible and resilient, easier to move around—and consequently less scarce. With capital easily available, the critical production factor shifted to people. But it did not shift to simple labor. Instead, knowledge displaced capital as the scarce production factor—the key to corporate success . . . All of these brain-rich companies cannot be managed in the old asset-oriented style. Their managers have had to shift their priorities, from running companies to optimize capital, to running companies to optimize people. People, in these companies, are the carriers of knowledge and therefore the source of competitive advantage . . . This gives us a entirely imperative for corporate success. A successful company is one that can learn effectively . . . That is why we need a new way of thinking about the measurement of success in our companies. By outsiders, we are judged and measured in economic terms: return on investment and capital assets. But within the company, our success depends on our skill with human beings: building and developing the consistent knowledge base of our enterprise. (pp. 17-21)

A practical example of how rationalist thinking tends to remain the dominant force—despite increased dialogue on more holistic, complex thinking—can be seen in Americans who are consumed with trepidation as India and China have successfully developed their reservoir of skilled labor. As more jobs transfer to these countries, some fear this success is at the expense of the United States. Yet, world-renown economist Jeffrey Sachs (2005) asserts skill development enables developing countries to move out of extreme poverty, which only benefits the entire global community.

These fears are fundamentally wrong and, even worse, dangerous. They are wrong because the world is not a zero-sum struggle in which one country’s gain is another’s loss, but is rather a positive-sum opportunity in which improving technologies and skills can raise the living standards around the world. Not only are the Indian IT workers providing valuable goods and services to United States consumers, but they are also sitting at terminals with Dell computers, using Microsoft and SAP software, Cisco routers, and dozens of other empowering pieces of technology imported from the developed countries. As India’s economy

grows, its consumers opt for a growing array of U.S. and European goods and services for their homes and businesses. (p. 16)

De Geus (1997) echoes, "In the years ahead, as developing countries expand their standards of living, corporations will be more needed than ever." He explains commercial corporations have only been around a short time—500 years—in comparison to the existence of human civilization. While they have been successful in terms of producing wealth, de Geus declares most commercial corporations are dramatic failures in light of their potential.

The average life expectancy of a multinational corporation—Fortune 500 or equivalent—is between 40 and 50 years . . . Human beings have learned to survive, on average, for 75 years or more, but there are very few companies that are that old and flourishing. (de Geus, 1997, p. 1)

de Geus also explains that he believes the

sharp difference between [the] two definitions—the economic company definition and the learning company definition—lies at the core of the crisis managers face today. The tension between them is almost certainly one of the key reasons behind the surprisingly low average life expectancy of companies in the northern hemisphere. (p. 21)

The brain of an individual human being can more easily perceive, adapt to, and actively engage with its environment than a corporation can, so de Geus (1997) suggests leaders need to take specific action to help companies improve their powers of perception and change to match the outside world before situations become crises.

Today, businesspeople ignore public attitudes on such issues as national sovereignty, colonialism and imperialism, pollution, conservation, exploitation, "the decline of the middle class," and even free trade at their peril. Social changes—such as the changing position of women in society, the growth of leisure, shifts in transport, and the evolution of consumer taste—continually create new employment opportunities and new markets, while old markets falter . . . All of these attitudes are key aspects of a company's business environment . . . I do not use [environment] as an ecologist might, to refer to natural surroundings. Rather, I use it to mean the sum total of all forces that affect a company's actions. In the last 20 years, that business environment . . . has shown oscillations of increasing frequency and amplitude. These reorient the corporate sense of purpose. In the heat of restructuring and reengineering, it's often easy to lose sight of the purpose of the change: to meet the changing pressures from the outside world. (p. 26)

So, it could be argued that even if corporate leaders have a strong preference toward a more controlled, rationalist worldview, the need for a more integrative and complex worldview is

not optional but rather essential for existence. Capra (1996) provides the scientific connection,

The new paradigm may be called a holistic worldview, seeing the world as an integrated whole rather than a dissociated collection of part . . . or [a much broader and deeper] ecological view. Deep ecological awareness recognizes the fundamental interdependence of all phenomena and . . . as individuals and societies we are embedded in (and ultimately dependent on) the cyclical processes of nature. (p. 6)

Yet, it would be inaccurate to say that rationalism is entirely inappropriate. Rather, it could be argued that both worldviews must coexist and a leader must have the agility to consider both perspectives and keenly discern the appropriate behaviors to employ based on the situation—just as dynamic CAS require. Once again, the analogy to the brain could serve to help our understanding. Physicist Norman Friedman (1997) explains,

The left [hemisphere] is sequential, and the right [hemisphere] is wholistic. It is almost as if we had in our heads both Democritus, the reductionist, and the wholistic Aristotle . . . Thus, the two sides of the brain reflect reality in complementary ways. Remarkably, each hemisphere is neither completely independent from the other nor are they totally fused . . . The right provides context and order, while the left provides facts and details. Both are needed for a balanced life, and the whole is far greater than the sum of its parts . . . The collective human consciousness can be seen as similar to the brain . . . The scientific view prevalent in the West is analogous to the left side of the brain, while the wholistic approach typical of Eastern thought is analogous to the right side. Unfortunately, the analogy is not exact. The two sides of the brain are connected by the fibers of the corpus callosum, whereas East and West have not yet found a bridge between their differing philosophical orientations. It is becoming increasingly clear that a future scientific paradigm will need to incorporate both: reality cannot be satisfactorily explained by exclusively embracing the Western or Eastern view. (pp. 273-274)

CONVERGENCE OF SCIENCE AND SPIRITUALITY

Finally, it would be remiss to not call attention to the unified concept that scientists and researchers are bringing to the forefront: the convergence of science and spirituality. Interestingly, this researcher did not begin the journey into complexity theory years ago with the awareness of the synchronization with spirituality. Yet, the exploration has revealed the two are inextricably connected. “Science as epitome of Western thought and spirituality as the epitome of Eastern thought are not separate disciplines; they are different aspects of the same whole, each dancing around the other, waiting to be merged in human awareness” (Friedman, 1997, p. 280).

This awareness, according to Miller and Miller (2002) with the Global Dharma Center, is emerging in business leadership. Miller and Miller propose that four distinct contexts have evolved in the West over the last 100 years:

- *Paternal-mechanistic*—including determinism, Freud, stimulus-response
- *Humanistic*—Einstein, theory of relativity, relative and situational, Deming
- *Holistic*—probability replaced certainty, systems theory and complexity science begin to model self-organizing nature, Darwin—not survival of the fittest but those most responsive to change, Carl Jung’s “collective unconscious”
- *Spiritual-based*—Jesuit Priest Teilhard de Chardin, a geologist and paleontologist, discovered “Peking Man,” Physicist David Bohm’s “omnipresent” field of energy/consciousness, Physicist Fritjof Capra’s integration of systems sciences and ancient spiritual text

Since the beginning of the 21st century, Miller and Miller suggest the spiritual-based context for business leadership has begun to emerge. More executive leaders—from companies like Medtronic to Motorola to Tom’s of Maine—are acknowledging the active role of spirituality in their work and leading from a spiritual-based context. What is particularly interesting is the first three contexts were influenced by science and psychology—not spirituality.

During the centuries of mechanistic, deterministic science, belief in and reliance on a God-focused religion declined; the age-old basis for ‘defining a meaningful life’ began to dissolve . . . As science uncovered new understandings of evolution, physics, and systems theory, a new seed of spirituality slowly began to sprout. (Miller & Miller, 2002, p. 12)

In practical terms, this means the end goal of business would no longer be wealth creation but rather seeing “money is the means for the ultimate goal of enabling an organization to sustain itself and grow in its ability to serve; wealth creation is simply a ‘natural result’ of excellence in living and working from a spiritual context” (Miller & Miller, 2002, p. 15). For example, in their interviews, Miller and Miller quote the Chairman of Medtronic:

Medtronic is not in the business of “maximizing shareholder value”; rather, our purpose is to “maximize patient value.” The “real bottom line” for Medtronic is the patients who were restored to full life and health last year by Medtronic products . . . At Medtronic we believe that if we first serve our customers well, provide products and services of unsurpassed quality, and empower our employees to fulfill themselves and the company’s mission, we will indeed provide an outstanding return for our shareholders. (p. 15)

Also, several articles and books, including Tom Chappell's (1993) *The Soul of a Business*, Mitroff's and Denton's (1999) *A Spiritual Audit of Corporate America*, and Guillory's (2000) *Spirituality in the Workplace*, have been written to address this search for meaningfulness in the workplace.

Other researchers are discovering individuals and organizations that may not use explicit spiritual language but generate a similar sense of purpose and meaning. One Senge et al. (2004) interview explains,

A wonderful example of an alternative to the "Washington consensus" model of global economic development is the Amul Model for dairy development replicated by the National Dairy Development Board in Gujarat, India. It's made India the largest producer of milk in the world and given millions of dairy farmers across the country livelihood and self-reliance. To date, one hundred thousand village cooperative societies have been established, governed by elected boards, comprised mostly of villagers. "We are not in the dairy business," Amul's managing director says. "We are in the society-building business. Business is not the goal. Business is a means to build a society that is just and fair and that empowers the poor. Democracy is not sitting in the Parliament in Delhi—it is starting at the grassroots level and giving the ordinary man a chance." (p. 171)

Jim Collins (2001) describes his research on Level 5 Executives in *Good to Great* as leaders who

build enduring greatness through a paradoxical blend of personal humility and professional will . . . Level 5 leaders channel their ego needs away from themselves and into the larger goal of building a great company [institution]. It's not that Level 5 leaders have no ego or self-interest. Indeed, they are incredibly ambitious—but their ambition is first and foremost for the institution and not themselves. (pp. 20-21)

Also, Robert Greenleaf (1998), based on his management research at AT&T, introduced the concept of servant-leadership, which has become popular terminology in some companies over the past 2 decades. And, Parker Palmer (2000) simply states, "True vocation joins self and service . . . the place where your deep gladness meets the world's deep need" (p. 16). What is interesting in all this is that many characteristics used to define servant leadership or how people are beginning to describe spiritual-based leadership are entirely consistent with how management complexity researchers are defining effective behaviors in complexity.

Yet, for as many that embrace the connection to spirituality, Senge et al. (2004) learned through their interviews that many still hesitate to publicly acknowledge the intersection.

A number of scientists we interviewed have very serious spiritual practices that they regard as integral to their science . . . this connection between inner work and outer work is one of the most important findings from the interviews. But most of them do not feel safe talking about it, even those who have achieved some integration of the two domains . . . In our present culture we rarely give ourselves permission to talk about connections between the spiritual and the professional. It's tragic. It keeps scientists like Brian Arthur from sharing the full extent of their insights. It obscures the creative process they have lived and limits future generations of students from their own creative work. (p. 39)

They also interestingly point out, when it comes to scientific revolutions, "The reality is that you have to wait until the establishment scholars finally retire from their positions and are replaced by a younger and more open generation of scientists" (Senge et al., 2004, p. 39).

Yet, regardless of the language being used—whether implicit or explicit, privately or publicly—there seems to be a consistent theme for those who subscribe to the convergence of science and spirituality: Leadership is about a sense of purpose beyond oneself, for some greater collective good. Of course, it could be argued that a leader can have a sense of purpose and not operate with complexity behaviors, so maybe the differentiator is the "beyond oneself, for some greater collective good." Certainly, it could be said that Hitler and Osama Bin Laden had or have a sense of purpose, and even argued a purpose beyond themselves. Yet, if leadership is once again considered purely from a scientific viewpoint—even ignoring the moral and ethical aspects—Hitler's and Bin Laden's purposes would not fit our understanding for effectiveness in complex systems. While it could be said that such leaders and their organizations may operate according to the "seven generally agreed principles" of complexity previously presented by the Santa Fe Institute, they do not fulfill the seminal understanding of complexity: the sustenance of life. In *The Hidden Connections*, Capra (2002) eloquently describes,

In the future, this strict division [of natural and social sciences] will no longer be possible, because the key challenge of this new century—for social scientists, natural scientists and everyone else—will be to build ecologically sustainable communities, designed in such a way that their technologies and social institutions—their materials and social structures—do not interfere with nature's inherent ability to sustain life. The design principles of our future social institutions must be consistent with the principles of organization that nature has evolved to sustain the web of life. (p. xix)

Once again, it comes full circle, returning to where it began with the science of it all.

The new understanding of life is a systemic understanding, which means that it is based not only on the analysis of molecular structures, but also on the analysis of

patterns of relationships among these structures and of the specific processes underlying their formation. As we have seen, the defining characteristic of a living system is . . . the presence of a self-generating network of metabolic processes. The processes of life include, most importantly, the spontaneous emergence of new order, which is the basis of life's inherent creativity. Moreover, the life processes are associated with the cognitive dimension of life, and the emergence of new order includes the emergence of language and consciousness. (Capra, 2002, p. 67)

Capra (2002) then connects this understanding with how spirituality fits into the picture. He reviews the original Latin meaning of "spirit" which means "breath," as do the Latin word "anima," the Greek "psyche," and the Sanskrit "atman." Capra suggests the common meaning indicates,

That the original meaning of spirit in many ancient philosophical and religious traditions, in the West as well as in the East, is that of the breath of life. Since respiration is indeed a central aspect of the metabolism of all but the simplest forms of life, the breath of life seems to be a perfect metaphor for the network of metabolic processes that is the defining characteristic of all living systems. Spirit—the breath of life—is what we have in common with all living beings. It nourishes us and keeps us alive. (pp. 67-68)

In conclusion, Capra (2002) gives a compelling description of the synchronicity of science and spirituality,

In accordance with the original meaning of spirit as the breath of life, Brother David Steindl-Rast [Benedictine monk, psychologist, and author of "Spirituality as Common Sense"] characterizes spiritual experience as moments of heightened aliveness . . . The aliveness felt during such a "peak experience," as psychologist Abraham Maslow called it, involves not only the body but also the mind. Buddhists refer to this heightened mental alertness as "mindfulness" and they emphasize . . . that mindfulness is deeply rooted in the body. Spirituality, then, is always embodied. We experience our spirit, in the words of Brother David, as "the fullness of mind and body." It is evident that this notion of spirituality is consistent with the notion of the embodied mind that is now being developed in cognitive science. Spiritual experience is an experience of aliveness of mind and body as unity. Moreover, this experience of unity transcends not only the separation of mind and body, but also the separation of self and world. The central awareness in these spiritual moments is a profound sense of oneness with all, a sense of belonging to the universe as whole . . . This sense of oneness with the natural world is fully borne out by the new scientific conception of life. As we understand how the roots of life reach deep into basic physics and chemistry, how the unfolding of complexity began long before the formation of the first living cells, and how life has evolved for billions of years by using again and again the same basic patterns and processes, we realize how tightly we are connected with the entire fabric of life. When we look at the world around us, we find that we are not thrown into chaos and randomness but are part of a great order, a grand

symphony of life . . . We belong to the universe, we are at home in it, and this experience of belonging can make our lives profoundly meaningful. (pp. 68-69)

It was interesting to try to explore the cognitive structures, mental models, and worldviews of leaders of complex systems and if they tended to have a sense of purpose—“a breath of life”—about their livelihood and leadership. This researcher posits that the more leaders are aware of complex learning—in themselves and with others—the more effective leaders will be at navigating complex systems. After all, complexity theory originated in physics—the foundation for other physical sciences—and the science of cognition is the foundation for all other social sciences. Hence, it is curious that both complexity and cognition take us to the root of understanding life. Could the emerging awareness about the convergence of science and spirituality—regardless of one’s particular belief system—humbly remind leaders it all connects to the same original source? This, ironically, is quite simple.

SUMMARY

This review of the literature provides theoretical background for complexity theory and cognitive science and the relevance of both domains to effective leadership in complex systems. Hence, the foundation for this study has been established. Chapter 3 describes the methodology applied in this study.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

PURPOSE OF THE STUDY

An interdisciplinary review of the literature suggests that complexity theory can provide a theoretical framework to better understand the emerging elements of leadership in complex systems, especially when studied from a cognition perspective. The primary focus of this study was to explore how leaders in complex systems, specifically at Oracle Corporation, describe leadership behaviors and employ cognitive skills as methods for advancing the organization's overall effectiveness and broader awareness.

The research questions posed in this study were designed to address the objective stated above and consider the principles of complexity theory (Holland, 1995) and related cognitive science implications. As discussed in Chapter 2, relevant theories and research from a myriad of fields informed this research design.

The primary research questions for this study were:

1. What elements of complexity theory, if any, do expert leaders observe and experience in a complex organization?
 - 1.1. What stories or critical incidents do leaders use to describe the challenges faced in a complex working environment?
 - 1.2. What stories or critical incidents do expert leaders use to illustrate and describe their complex working environment?
2. What elements or associated behaviors of complexity theory, if any, are expert leaders employing—implicitly or explicitly—in their complex working environment?
 - 2.1. How do leaders approach organizational planning, goal setting, and decision making?
 - 2.2. How do leaders approach changes in their working environment and organizational direction (caused by either internal or external factors) and adjust or not adjust to unexpected outcomes?
 - 2.3. How do leaders describe their personal learning style and information collecting process?
 - 2.4. How do leaders use stories to share information and encourage the exchange of knowledge within their organization?

- 2.5. What assumptions do leaders make about their complex organizations?
3. What enables certain leaders to effectively guide others through complexity when other leaders are less effective?
 - 3.1. What would be a needed worldview for a leader to be a facile manager of complexity and ambiguity?
 - 3.2. How do leaders describe their desire to lead or purpose for leading a complex organization?
4. How do experienced leaders of complexity believe other leaders can learn (or be taught) characteristics or skills to become more effective in complex environments?
 - 4.1. When (at what age, career stage, etc.) do most highly effective leaders tend to develop their skills to manage complexity and when is the optimal time to teach such skills to prepare leaders for effective leading in complexity?

This study looked to explore how executive leaders describe effective elements of leadership in complex systems and how their ideas might compare to existing models and theories of leadership in corporations. This study was also designed to inform the best practices of leaders that must operate effectively in complexity by probing possible ways to encourage leader and organizational learning.

THE DELPHI METHOD

The Delphi method was deemed as the most appropriate method to address the research questions proposed in this study. The purpose of Delphi applications is “the reliable and creative exploration of ideas or the production of suitable information for decision-making” (Wissema, 1982, p. 1). The concept is that well-informed individuals, employing their insights and experience, are better equipped than theoretical approaches to provide reliable responses to a question or predict the future on a specific topic. “The Delphi method recognizes human judgment as legitimate and useful inputs in generating forecasts” (Wissema, 1982, p. 1).

The Delphi technique is a structured process for collecting and distilling knowledge from a group of experts through a series of questionnaires interspersed with controlled opinion feedback (Adler & Ziglio, 1996). It allows geographically dispersed, preselected experts to deal systematically with a complex problem or task. Reliability is improved by giving a series of questionnaires that reiterate the same questions to individual participants, while providing cumulative group feedback from previous rounds (Helmer, 1983). “Group results are fed back to the participants in cumulative form and are most often given in terms

of means, medians, or standard deviations” (Bustamante, 2005, p. 48). Once participants have received the group feedback after each questionnaire, individual participants are given the opportunity “to modify or refine their judgments based upon their reaction to the collective views of the group” (Mitroff & Turoff, 1975, p. 22). Panelists are provided with a final summary after the last round of questions, which is usually three or four rounds, or when group consensus or researcher determination is reached.

Participants are referred to as the Delphi panel and their responses remain anonymous. Panel members are not brought together physically, do not actually interact with one another, and can reside anywhere in the world. “Instead, information is exchanged via mail, FAX, or email. The technique is designed to take advantage of participants’ creativity as well as the facilitating effects of group involvement and interaction” (Dunham, 1998, p. 1). Wissema (1982) explains the method “has been developed in order to make discussion between experts possible without permitting a certain social interactive behavior as happens during a normal group discussion and hampers opinion forming” (p. 1). And, when full scientific knowledge is lacking on a topic, decision makers have to rely on their own intuition or on expert opinion; the Delphi method enables such perspectives to be shared.

DEVELOPMENT OF DELPHI METHOD

The Delphi method was developed in the RAND Corporation over a period of years during the 1950-1960s. Olaf Helmer, Norman Dalkey, and Nicholas Rescher initially developed it to forecast the impact of technology on warfare at the beginning of the Cold War (Gordon, 1994; Wikipedia, 2006). The name “Delphi” was derived from the site of the Greek oracle at Delphi where the future was foretold using hallucinogenic vapors. However, Dalkey (1968) explains the method is not about “something oracular” but rather primarily concerned with making the best you can of information that is less than perfect. Such information involves value judgments and is usually not factual. The Delphi method recognizes the value of expert opinion, experience, and intuition and allows using the limited information available in these forms, when full scientific knowledge is lacking (Wikipedia, 2006).

Research using the Delphi technique initially focused on assessing long range trends by making predictions about science and technology and their likely impacts on society

(Adler & Ziglio, 1996; Linstone & Turoff, 1975). Increasingly since the 1970s, it has been used in business, social science, and education. The Delphi method can fill several roles in a corporate environment: an educational device for senior management, environmental trend background material for technological planners in research laboratories, and trading material for use with planner-counterparts in other organizations (Linstone & Turoff, 1975). While study results can be used to an advantage in the business environment, it is important to note that results can be misused if they are “viewed as representing a corporate position, policy, or forecast” (Day, 1975, p. 189). Linstone and Turoff also assert that large, diversified, multinational corporations can involve overseas employees in a Delphi with relative ease and minimal costs, and the rate of response tends to be higher than average due to the hierarchical environment of a business.

STRENGTHS AND LIMITATIONS OF THE DELPHI METHOD

Reality is a name we give our collections of tacit assumptions about what is. We bring along these realities to give meaning to our interactions . . . the important thing is not how many different realities we each have, but that one important product of each Delphi panel is the reality that is defined through its interaction. (Scheele, 1975, p. 37)

The creation of such a construct for the study’s specific context seems to be a critical objective to keep in mind. The Delphi method offers some key strengths. First, it encourages the creative exploration of ideas. The Delphi is appropriate for examining broad or complex problems that require subjective, value judgments or opinions and do not lend themselves easily to precise analytical and strictly statistical analysis (Linstone & Turoff, 1975). Second, the Delphi method is designed to encourage a true debate, independent of personalities; hence, anonymity is required in the sense that no one knows who else is participating. This was determined because the RAND researchers explored the use of expert panels to address forecasting issues. Gordon (1994) explains the researchers reasoned,

Experts, particularly when they agree, are more likely than nonexperts to be correct about questions in their field. However, they found that bringing experts together in a conference room introduces factors that may have little to do with the issue at hand. For example, the loudest voice rather than the soundest argument may carry the day; or, a person may be reluctant to abandon a previously stated opinion in front of his peers. As with normal thinkers, the give-and-take of such face-to-face confrontations often gets in the way of a true debate. (p. 4)

Hence, online questionnaires and electronic mail feedback encourage such virtual “discussion.” Third, iterative feedback on the questionnaire responses is sent through electronic mail to the panel. Since the force of oratory delivery is eliminated (because of the anonymous, virtual nature), extreme opinions are synthesized by the researcher to give all the responses equal “weight” and are then shared with the entire panel as a whole for further analysis (Gordon, 1994). Fourth, the technique allows for involvement from a geographically dispersed panel of experts.

The Delphi technique also has some limitations. First, some researchers question the credibility and experimental validity of the Delphi method because it does not follow traditional scientific methodology (Linstone, 1975). This alludes to the notion that science is “objective” which is somewhat intriguing (debatable) given the emerging understanding of complexity theory, as previously described. Second, Delphi studies are difficult to replicate since the results are based on the opinions of a group of experts (Helmer, 1983). A third weakness is that future developments are not always predicted correctly by iterative consensus of experts, but instead by unconventional thinking of amateur outsiders (Wikipedia, 2006). Fourth, there is potential for researcher bias because the researcher might intentionally or unintentionally limit the range of participant input based on the structure of the Delphi (Linstone & Turoff, 1975). Another disadvantage to the Delphi method has to do with the challenge of sustaining a high degree of participant motivation so that panel members do not drop out in the later questionnaire rounds of the study. Linstone and Turoff observed that an acceptable consensus is usually reached and the participants remain engaged through about three or four rounds of the Delphi study. Finally, since the number of respondents is usually small, Delphis do not (and are not intended to) produce statistically significant results; in other words, the results provided by any panel do not predict the response of a larger population or even a different Delphi panel. They represent the synthesis of opinion of the particular group, no more, no less (Gordon, 1994). “The value of the Delphi method rests with the ideas it generates, both those that produce consensus and those that do not. The arguments for the extreme positions also represent a useful product and should be considered” (Gordon, 1994, p. 7).

SELECTION OF THE DELPHI METHOD FOR THIS STUDY

Even contemplating the limitations of the Delphi method, this methodology was determined most appropriate for this study for several reasons. First, the concept of complexity theory has not been aggressively explored from a practitioner perspective in international corporations; hence, it was uncertain how executive leaders would find it to be of relevance and informative to effectively leading in complex systems. This Delphi study explored expert opinions on how awareness of complexity theory and its associated cognitive skills contributed to an environment. Second, expert panel members were selected from executive leaders located in each of Oracle Corporation's regions around the world: North America, Latin America, Asia Pacific, and Europe and Middle East. The Delphi method accommodated the anonymous collection of opinions from these geographically dispersed panel members. Third, the Delphi method allowed for online discourse between experts without the challenges of different language, culture, and social patterns that would exist in face-to-face or telephone discussions.

This study was considered exploratory in nature since complexity theory is still emerging and considered relatively new in its application or relevance to the social sciences. Given this, the Delphi method was a logical approach to begin to discover the perceptions of geographically dispersed executive leaders on effectiveness in complex systems. "The committee-free environment and anonymity of Delphi stimulate reflection and imagination, facilitating a personal futures orientation. Thus, the modern Delphi is indeed related to its famous Greek namesake" (Linstone & Turoff, 1975, p. 16).

PARTICIPANT SELECTION

The key to a successful Delphi study lies in the selection of participants. Since the results of a Delphi depend on the knowledge and cooperation of the panelists, persons who are likely to contribute valuable ideas are essential to include. (Gordon, 1994, p. 9)

Participants selected to serve on the expert panel for this Delphi study were chosen from executive leaders—with the title of vice president or above—located in countries within each of Oracle Corporation's defined regions around the world: North America, Latin America, Asia Pacific, and Europe and Middle East. Oracle provides a fruitful environment to select a Delphi panel of experts given the inherently complex nature of the software industry and the

dynamic, quick changing culture that Oracle is publicly known for. The company has more than 55,000 employees worldwide and has offices in more than 140 countries. The executive leaders must effectively function in the same complex environment, but they are diverse in that they reside in various countries and have their own unique life, employment, and personal experiences that have shaped them. The executives nominated for this study have 2 or more years of experience in a formal authority position, and the representative number of executive leaders selected targeted the corresponding percentage of employees located in each region: North America, 43%; Europe and Middle East, 26%; Asia Pacific, 28%; and Latin America, 3%.

Executive leaders at Oracle are typically responsible for determining their respective organizations' vision, direction, and implementation plans. An executive leader's team size varies depending on company needs and specialty areas. To recruit executive leaders to serve as experts in this study, individuals were nominated by six, well-informed human resources senior leaders who regularly interact with executive leaders in the various business units across the globe. The senior leaders from human resources were asked to consider which business unit leaders have experienced significant, complex challenges within their organizations in the last year or 2 and to nominate the leaders that exhibited expert performance while leading their organizations through these challenges. While evaluating expert performance can be somewhat subjective, human resources leaders were guided by the "self-assertive" and "integrative" human behaviors or tendencies that Physicist Fritjof Capra proposes; they were asked to nominate executives that demonstrate a healthy balance of the tendencies presented in Table 1 when navigating complex challenges.

When nominating executives, human resources leaders were also asked to consider ethnic and gender diversity that appropriately represents the composite of the respective business units. Once executive nominations were submitted, the researcher carefully reviewed the nominees to ensure they appropriately reflected the regional and business unit populations from a demographic perspective. Extra or unsuitable nominees were discarded from the expert panel invitations; nominees that met the ideal criteria as closely as possible were retained. Once the final list of nominees was identified, the researcher confirmed the final list with the senior executive team of human resources for a last check of the expert panel. Then, the researcher electronically mailed a personal cover letter to each expert panel

nominee and indicated they had been specially selected for this expert panel opportunity. The cover letter also explained the study at a high level, stipulated the criteria for participation, shared how their participation could provide beneficial insight for future organizational development initiatives, and gained commitment for their involvement in the study. In addition, the cover letter explained the confidential and anonymous nature of this study but acknowledged that participant responses might be self-revealing based on examples or comments they chose to express.

To summarize the aforementioned qualifications for expert panel participation, the predetermined criterion included:

1. At least 2 years working in a formal authority position in a corporation. For purposes of this study, formal positions included: director, senior director, vice president, senior vice president, and executive vice president. Vice presidents who were recently promoted or new to Oracle were eligible as long as they served in one of the preceding positions.
2. Identified by human resources leaders as having expert performance and effectively functioning in complexity.
3. Fit within the representative number of executive leaders needed from each Oracle region, business unit, and demographic.

The first and second criteria were justified by the fact that formal authority positions influence a complex system. While influential leaders may not necessarily hold formal leadership authority, it is generally assumed that vice presidents have the positional power to impact an organization's overall effectiveness. Criterion three was important because expert panel members should reflect the overall population and variety of cultures in Oracle.

The subjects were considered to be well regarded in their positions and recognized as exhibiting, in general, the characteristics of the proposed theoretical framework. However, such characteristics were not strictly required since such claims can often be subjective and the purpose for the study was to explore the likely or emerging characteristics needed for leaders to effectively lead through complexity.

All recruited panel members who agreed to participate were asked to complete an informed consent form in order to proceed with the study. Follow-up telephone contact was not needed with the nominated experts.

In regards to the size of an expert panel, Linstone and Turoff (1975) recommend a Delphi panel size between 10 to 15 participants. Gordon (1994) suggests that most studies

use panels of 15 to 35 people, and the length of the list should anticipate an acceptance rate between 35% and 75%. A number closer to 20 to 25 experts was targeted in order to allow for inevitable attrition in the participation level throughout the Delphi rounds of questioning.

DATA COLLECTION

This researcher received approval of this study from the Institutional Review Board (IRB) of San Diego State University and the University of San Diego in December 2006. The Delphi process involved iterative questioning of a panel of participants using a series of questionnaires; each administration of a questionnaire was considered one round of the process. Panelists indirectly collaborated to explore important elements of being an effective leader in a complex system. Participant responses were analyzed and summarized by the researcher and then sent as feedback, organized in categories with every effort to preserve anonymity among the participants. Subsequent rounds of questionnaires continually investigated more in-depth information of ideas presented by participants, enabling an increased sense of ownership among the panel members.

All data were collected using an online survey system. The researcher designed questionnaires using the online system and then embedded links to the appropriate questionnaires in personalized electronic mail letters sent to individual Delphi panel participants in each round.

To increase the likelihood of high participant motivation, the researcher analyzed and compiled panel member responses and sent compiled summaries to members for their review after the questionnaire submission for each round. Questionnaires for the sequential rounds were distributed a few days following the distribution of the compiled results from the previous round. Expert panel members were given almost 1 month to complete the first questionnaire (extra time was allowed due to the timing around the holidays) and approximately 2 weeks to complete the second and third round questionnaires. Appendix A outlines the phases of the study with dates and timeframes.

Advantages of Electronic Mail and Online Questionnaires

The Oracle work environment actively relies on the ability to work virtually, and effective use of the Internet is central to its way of operating. Hence, this study was

conducted using electronic mail correspondence and online questionnaires, which could be accessed by clicking on links embedded in electronic mail messages. This approach also allowed for geographically dispersed corporate executives, who juggle multiple priorities with a regularly intense schedule, to easily access and submit information. This was determined as the most efficient and meaningful way to collect data from this subject group, and the participants appeared to be motivated based on the extensive amount of written information many of them provided, the relatively low attrition rate for the study (especially given holiday times and quarter-end deadlines), and the fact that many panel members expressed their interest in having an “executive community” to learn from peers and exchange ideas.

Electronic correspondence and questionnaires had several advantages for both the study participants and the researcher. There were quick response times with email messages between the researcher and the participants, and this also seemed to create a stronger sense of commitment. Respondents could also access and respond on a computer at their convenience, allowing for reflection and the ability to return to their online questionnaire if they chose to make revisions or complete the questionnaire itself over more than one time segment. Panel members were not asked to complete any handwritten forms or send anything by regular mail. Use of the Internet also made it possible for data from 12 different countries to be collected. The researcher could more easily access and sort the data, track progress of the responses and send friendly reminder messages, and analyze data in cumulative form (for certain questions that did not involve open-ended answers). It was also less expensive to use online questionnaires due to savings from printing costs and postage that would have been necessary for paper questionnaires. Finally, the convenience of the online questionnaires and the feedback summaries sent to the expert panelists through electronic mail may have increased the likelihood of executives remaining reasonably engaged throughout the iterative questioning process.

Disadvantages of Electronic Mail and Online Questionnaires

The primary disadvantage to using online questionnaires and electronic mail related to the potential for technical difficulties since there was complete reliance on servers and computer systems for all data collection and communication. Yet, given the nature of Oracle

being in the high technology/software industry, this in itself helped to ensure the quality and reliability of online communications. There were not any difficulties related to electronic mail. And, as for the online questionnaire tool, it was also very safe and secure and there was only one technical glitch when “reminder” messages with the embedded online questionnaire link were returned to the researcher. Since the Oracle culture and its executives are completely reliant on email and Internet interactions to accomplish their everyday work across multiple countries, there was little concern for miscommunication or confusion with the technology.

To ensure anonymity and avoid potential communication problems, the researcher confirmed a precise electronic mail address list prior to every distribution of the questionnaires and summarized feedback documents. The risk of losing essential electronic data also existed, so the researcher consistently backed up and saved all data files.

To abate the preceding risks, pretest messages were done before sending any correspondence, online questionnaires, or attachments to Delphi panel participants. An updated list of the electronic mail addresses of all the consented participants was carefully maintained to ensure efficient and polished communication. The researcher also extensively focused on writing clear messages that conveyed a positive, personalized tone to enhance communication and trust with all panel participants, especially realizing that while all the executives are fluent in English, it was not necessarily the first language of every participant.

Researcher Role

The researcher took the role of facilitator to allow for meaningful knowledge generation in this Delphi study. The researcher performed several steps including, but not limited to: setting criteria for selection of expert panel members, requesting nominations from human resources executive leaders (Appendix B), and inviting nominated executives to serve on the expert panel; conducting a pilot study before the first round questionnaire; developing four Internet questionnaires for each round of questioning, including a background questionnaire; analyzing data from each round of questions to identify emerging themes and determine consensus; summarizing the compiled panel feedback and “educating” or exposing panel members to theoretical concepts related to their input to explore further thinking and follow-up questions on specific topics; and synthesizing final data for

implications and recommendations, determining possible future steps, and writing up and presenting findings of the study.

In addition, the researcher kept a subjectivity journal or notebook to actively note honest thoughts, feelings, and perceptions throughout the research process. As suggested in other completed Delphi studies (Bustamante, 2005), the purpose was to make additional efforts to decrease bias and enhance reliability and objectivity.

Pre-Delphi: Pretest of Round One Questionnaire

An initial questionnaire was pretested and reviewed with a group reflective of the expert panel to examine for face validity, clarity of questions, and the relevance to the concept of leadership in complexity. The representative group consisted of 6 current or former executives of large corporations similar to Oracle. The importance of conducting a pretest of the first Delphi questionnaire in order to improve questions and format and increase overall validity is suggested by Creswell (1998). Minor modifications to the first round questionnaire design were made based on feedback from the executives who participated in the pretest.

Data Collection: Round One

To begin to identify how experts describe their organizations and what leadership behaviors and characteristics are important to effectively lead complex systems, the initial questionnaire asked executives for stories or critical incidents that helped to define their working environments and work challenges as well as how they are operating and behaving in their leadership roles. Participants were also asked to share their opinions and experiences on open-ended questions about the greatest challenges to effectively leading, their leadership philosophies, communication approaches, and learning approaches; this helped to illuminate common or different approaches being used by various leaders within the same complex system and identify emerging themes. The expert panel was also asked about the key characteristics or skills that make a leader effective and the top reasons a leader is ineffective. All questions were open ended so as not to constrain any ideas and thoughts from the expert panel. The final optional question allowed panel members to provide additional information about their work environment that helped to further explain its intricacies or dynamics.

The Round One questionnaire primarily addressed the first and second research questions (and their associated subresearch questions) and was general and broad enough so as not to limit panel participants in how they perceived and defined their organizations and the way they function. For example, the questionnaire did not explicitly ask about such topics as adaptability, decision making, and tacit knowledge but rather the possibility for insight into such topics was embedded in questions that allowed for leader experiences and challenges to be described. Also, it was important in this first round to not explain concepts and associated leadership or management behaviors of complexity theory so that participant responses were unconstrained; this allowed organizational and leadership behaviors to be objectively considered and compared to the definitions of both rationalism and complexity theory. This first round also provided some insight into the worldviews that executives hold.

On December 21, 2006, the Round One questionnaire was sent to the 32 executives who had submitted their informed consent forms (Appendix C). Panel members could access the online questionnaire by clicking on the link embedded in the electronic mail cover letter (Appendix D) that was sent to them. Participants were given several weeks to complete the Round One questionnaire (Appendix E) and asked to submit the questionnaire by January 13, 2007. After sending a friendly reminder message in early January, 26 participants submitted their questionnaires by this deadline. The 6 remaining executives, who had originally consented, were removed from participation in the study due to time pressures. Interestingly, all 6 of the executives who originally expressed interest but were unable to participate were located in the North America region and 5 of the 6 worked in the sales and consulting business units which were undergoing significant senior leadership changes due to a recent resignation.

The panel members were thanked upon completion of their questionnaire. A cover letter (Appendix F) with the compiled data from Round One (Appendix G) was sent to all 26 panel members on February 7, 2007. The intention was to provide feedback for participants to peruse, reflect upon, and compare other panel member responses in preparation for the Round Two questionnaire. In addition, the researcher presented some theoretical constructs that related to the panel members' initial input with the goal of extending their thinking so specific topics could be explored in more depth during the second round. One panel member wrote the researcher to express thanks for the interesting summary.

Data Collection: Round Two

The objective of the Round Two questionnaire in this Delphi process was to encourage expert panel members to reflect upon their own responses and their fellow panel members' responses to the Round One questionnaire and, then, begin to thoughtfully consider which behaviors, capacities, worldviews, and skills might be essential to being an effective complexity leader. A goal was to try to move the panel toward consensus on important elements by having them rate the priority of several previously reported leadership elements or challenges. For each of these items, participants were asked to rate how important or essential each of the skills or challenges were to effectively leading in complexity, on a Likert scale of 1 (not at all important/essential) to 5 (very important/essential). To encourage further input, participants were also asked about "significant learning experiences" and their use of "stories" as they related to their learning and communications approaches, respectively. These specific questions aimed to address the second research question and its subresearch questions in more depth and also the fourth research question.

Based on the responses from Round One, it was also useful to identify the dichotomy between rationalism and complexity and this was explored further with multiple choice questions and open-ended questions about Physicist Fritjof Capra's model of "self-assertive" and "integrative" behaviors and also his view about the "relational" nature of problem solving. Brief descriptions (reading materials) about concepts related to complexity theory accompanied the first round summarized feedback sent to the executives and was also incorporated with the second round questions to help increase panel members' understanding, hence allowing panelists to provide more meaningful responses in the open-ended questions about what enables or prohibits leaders from possessing or exhibiting essential complexity behaviors and skills. The questions with theoretical constructs were intended to further explore the third research question (and its subresearch questions), especially aiming to investigate the possible worldviews and capacities that enable leaders to be effective in complexity. The final optional question allowed panel members to express what they were particularly interested in and helped to maintain overall engagement.

On February 9, 2007, an electronic cover letter (Appendix H) and the Round Two questionnaire (Appendix I) were sent to the 26 panel members with a request to complete the

questionnaire by February 20, 2007. Two friendly “reminder” notes were sent (as the due date approached) to the participants whose names did not indicate “responded” on the researcher’s online tracking list. Eighteen participants submitted their questionnaires by the due date. They were automatically thanked upon submission of the questionnaire. One additional panel member tried to also respond several days after the online questionnaire was closed but the Round Two feedback summary and the Round Three questionnaire had already been sent to the 18 participating panel members. The panel member apologetically contacted the researcher to explain her recent business travel obligations. The researcher sent the Round Two compiled data (Appendix J) to the 18 panel members on February 23, 2007, with a cover letter of helpful tips about the data and when to expect the next round of questions. Given the interest of the additional panel member that would have submitted the questionnaire after the due date if possible, the researcher anticipated that all 8 executives that were unable to complete the Round Two questions might also have a continued interest in the study. Hence, the researcher sent the Round Two feedback summary to the additional 8 executives and also sent them a separate link to the Round Three questionnaire. The researcher arranged in the online tool for the questionnaire to be collected for two different groups: the 18 panel members that had completed both Rounds One and Two and the additional 8 panel members who had completed Round One only and might have an interest in completing Round Three. Two separate collection groups were established to ensure the integrity of the data with the 18 consistent panel members but also to allow the 8 additional executives to have the possibility of contributing since they were still part of the same work environment. Upon receipt of the researcher’s messages, 3 of the 8 additional executives immediately sent the researcher an email and apologized for their busy schedules and missing Round Two and then proceeded to complete the Round Three questionnaire.

Data Collection: Round Three

The goal of the Round Three questionnaire (Appendix K) was to further refine panel agreement on the leadership elements perceived to be important in complex systems. Participants were asked to rank the importance of previously identified challenges that leaders must be proficient at managing if they are to be effective in complexity. In Question 2, panel members were also asked to rate the most important learning experiences

in an “ideal” world based on the “significant learning experiences” the panel had identified in the previous round. To add more depth to the data gathered and how it might be practically applied, panel participants were also asked their perspective on the optimal times for a (future) leader to be taught important lessons or acquire certain skills to become effective complexity leaders. Feedback to these inquiries provided some suggestions that might be helpful for future training, recruiting, and talent development initiatives and helped to indicate important times when they believed skills should be nurtured.

Questions 4 and 5 presented theoretical concepts to encourage panel members to think more deeply about “learning” for individuals and organizations and to possibly allow for deeper reflection and creative input on these open-ended questions. The next three multiple choice questions followed up on the top rated “learning” and “communications” approaches that had been identified by the panel in the first two rounds. The goal was to consider actual observation of such behaviors and to explore, from their perspective, if “explicitly” discussing such behaviors (rather than allowing tacit assumptions or operating norms to continue) would make a difference in behaviors. The final two open-ended questions inquired about adaptive behaviors and their purpose for leading, hoping to once again more deeply understand the behaviors that exist in their work environments and the worldviews (or “life themes” as described in Chapter 2) that motivate them to be in leadership roles. To encourage participant ownership over the ideas studied, panel members were also given the opportunity to answer an optional question that allowed them to comment on any of the topics that had been discussed in the study. The objective of the Round Three questionnaire was to more comprehensively explore the third research question (and its associated subresearch questions) and the fourth research question (and its associated subresearch question).

The Round Three questionnaire (Appendix K) was sent with an electronic mail cover letter to the 18 consistent panel participants on February 26, 2007. On the same date, the identical Round Three questionnaire and similar cover letter were also sent separately to the additional 8 panel members who had completed only the Round One questionnaire. The submission due date was March 7, 2007, and a thank you was sent to participants upon completion. As the due date approached, two friendly reminder notes were sent to those who had not yet responded. The researcher also left a kind voicemail for the last of the 18

executives (consistent group) who had yet to complete the questionnaire on the actual due date. The executive completed it (in part) immediately and all 18 panel members submitted the Round Three questionnaire. While the additional 8 executives were given the option of completing the questionnaire, 7 of them chose to complete it (5 completed the entire questionnaire and 2 completed half the questionnaire) by the due date. Several executives, from both the consistent group of 18 panel members and the additional 8 panel members, wrote the researcher directly to express their gratitude for being reminded and having the opportunity to participate on the panel. The researcher sent the Round Three compiled data (Appendix L) to the entire panel on March 13, 2007.

Data Collection: Background Questionnaire

Although demographic information on the panel members' titles, gender, regional locations, and business units had already been collected, the researcher decided to collect background information from the panel members to obtain a basic profile of the expert panel. The background questionnaire (Appendix M) was distributed with the Round Three questionnaire as the beginning page of the questionnaire in order to reduce the amount of times panel members had to be sent emails and online questionnaire links. All 26 panel members (from both the group of the 18 consistent panel members and the 8 additional members) completed the entire background questionnaire.

Questions for the participant profile background questionnaire were based on models used in other Delphi studies. Demographic information on Oracle as a whole had already been obtained through other means, so questions about panel members' experience levels and organization size were designed. Gender was also confirmed and inquiries about their interest in being associated with this study or possible future discussions were also presented. While the original panel nomination and selection process made careful efforts to match the company's overall percentage breakdowns for gender, regional location, and business unit, actual correlations between institutional demographics and panel members were not the focus of this study. Yet, future research efforts may want to examine these relationships more closely.

The background questionnaire contained a total of 10 questions with 1 open-ended question asking panel members to describe their nationality or ethnicity, since it is not

uncommon for panel members to reside in one country or support a certain region but not necessarily be native to that country or region. The background questionnaire was sent to panel members on February 26, 2007, and all 26 questionnaires were returned. The researcher sent the demographic summary results (Appendix N) to the panel on March 13, 2007.

DATA ANALYSIS

The researcher is obligated to compile, analyze, synthesize, and summarize data from each round of questionnaires in a Delphi study so that feedback can be provided to panel members after each round of questioning. This data, in concert with the overall research questions, provide the basis for designing and developing questionnaires for subsequent rounds. During analysis, emerging concepts and common themes were identified and coded in panel members' written responses and then categorized and tallied to measure how many participants mentioned each item. The researcher was very careful to not infer meaning or merge ideas into similar thoughts and erred on the side of caution by creating an additional category or subcategory if there was any concern about mis-grouping. The researcher also made every effort to keep the category and subcategory labeling consistent with the type of language panel members used to describe topics. It was difficult for categories to be completely mutually exclusive and some overlap of ideas may be evident. However, an external reviewer (not affiliated with Oracle) also reviewed every round of compiled results and the categories and subcategories of the anonymous input to check that the feedback was accurately and clearly recorded.

After the analysis of each round, expert panel members were sent a complete summary of all responses with the number and percentage of panel members who reported or evaluated the importance of each item. In many cases, direct quotes from participants were also included in the summaries to enhance a feeling of ownership. Summaries were sent by electronic mail to expert panel members for their review and reflection at least 2 days prior to the mailing of the next questionnaire. Items chosen for each subsequent questionnaire had either been reported by 2 or more panel members in the open-ended questions or received a panel consensus of at least 66% and an average response rating of 4.0 (on a Likert scale of 1-5) when rated in the preceding round of questions. Literature of the Delphi technique

explains that a high degree of consensus can be implied when panel agreement is at more than 60%. Yet, several items rated less essential or important in this study could still be considered useful and meaningful, depending on the context. In questions that involved rating or ranking, the percentages and response averages for each item were calculated and also shared with the expert panel members.

First Round Data Analysis

The data analysis for the first round proved to be the most intense because of the extensive input the expert panel provided on eight open-ended questions. The researcher coded and tallied each open-ended question and looked for themes or categories where possible. While the broad approach with open-ended questions was intentional so as not to constrain participant thoughts and allow ideas to emerge, it was a time-consuming examination to ensure the input was accurately categorized and rechecked (by both the researcher and the external reviewer) to confirm the initial themes identified. Since the first round input set much of the framework for the rest of the study, the researcher believed this was necessary, and, ultimately, it helped to alleviate the potential for misinterpretation, miscategorization, and researcher bias (Appendix G).

In Question 1, panel members reported what they perceived to be the greatest challenges to effectively leading in today's work environment. Four main categories emerged from the responses submitted: global, virtual, or multicultural challenges; challenges related to human skills, attitudes, and cognitive capacities; challenges related to collaboration and teamwork; and challenges related to the business industry or company environment. Subcategories within each of the main four categories were also determined based on the topics mentioned by the panel members. For Question 2, panel members described a "significant work challenge" they experienced within the last 2 years. These challenges were then carefully examined to determine how many described characteristics of a CAS (as defined in Chapter 2). In addition, using the four main categories that emerged in the first question, the "significant work challenges" were also distributed into the appropriate "challenge" category (based on what seemed to be the primary theme that emerged from each work challenge description). In the Round One summary, the category count for the challenges was sent to the panel members along with a brief definition of CAS.

The third question asked participants to describe their leadership philosophy and, after carefully considering multiple ways to categorize these responses, the researcher determined it would be most meaningful to exam the philosophies from the perspective of Physicist Fritjof Capra's theoretical construct of "self-assertive" and "integrative" behaviors. To give the panel members some context, a brief definition of this model was sent to them with the categorized leadership philosophies in the summary document. Communication approaches and learning styles were described in Questions 4 and 5, respectively. For both questions, three main categories (and subcategories within each of the main categories) emerged from the responses submitted by the participants: formal communications or learning, informal communications or learning, and worldviews about communications or learning. Question 6 asked the panel members to identify the key characteristics that make a leader effective, and, in similar fashion, Question 7 asked them to identify the top reasons leaders are ineffective. The researcher tallied the number and percentage of participants who reported an item and, in total, 13 effective characteristics and 12 reasons for being ineffective emerged from the input. In the final optional question, participants had the opportunity to share additional information that further explained the dynamics or intricacies of their work environment. Seven panel members chose to write brief comments; however, there were not any unique themes that emerged from this input, yet it did help to confirm the information already provided and themes identified in the previous questions.

Second Round Data Analysis

In the first question, the expert panel reached a consensus of 66% or more on the most important eight challenges (those rated a 4 or 5 on a Likert-rating scale) that leaders must be adept at if they are to be effective. The top six items also received an average response rating of 4.0 or greater. Question 2 revealed consensus of 61% or greater on all 10 of the characteristics or skills that panel members had originally identified as key to making a leader effective, and 7 of those 10 received a consensus of 83% or more. The ineffective characteristics or skills (identified by the panel in Round One) that are most difficult for leaders to overcome also found consensus of at least 61% on 7 of the 10 items listed in Question 3. The compiled summary of the Round Two responses (Appendix J) contained matrices that presented the degree of panel consensus on each rated item. Columns 4 and 5

on the rating scale were combined to determine the degree of consensus on those items rated high on the scale.

The Round Two results also discovered more consensus and further perspectives on essential learning and communications approaches in Questions 4 and 6, respectively. Based on the Round One findings, the panel reached a consensus of 61% on 7 of the 16 learning items, and all 11 communications items also received a consensus of at least 61%, with all but 1 item reaching a 72% consensus. This round also included open-ended questions. To delve deeper into learning and communications, Question 5 asked panel members to recall a learning experience that had a “significant impact on their growth as a leader” and 10 categories of experiences emerged in the results. Exploring similar depth, in Question 7, the panel explained whether they thought the communication technique of “telling a story” was used often in their organizations and if they believed stories helped to increase understanding with others. It was indicated that 41.6% of the panel members use stories moderately or regularly and 81.3% find stories helpful or somewhat helpful to increasing understanding.

The next series of questions (8, 9, and 10) were not intended to necessarily reach consensus; however, they followed up on a concept that had been introduced in the Round One compiled results when the panel’s leadership philosophies were reviewed from the theoretical perspective of Physicist Fritjof Capra’s “self-assertive” and “integrative” behaviors (explained in Chapter 2). Of the total responses, 58.8% reported they actually observe leaders practicing “self-assertive” behaviors, 5.9% observe “integrative” behaviors, and 35.3% observe a “combination of self-assertive and integrative” behaviors. In contrast, panel members also indicated what behaviors they believed were most effective in complex environments; 11.8% responded “self-assertive,” 23.5% responded “integrative,” and 64.7% responded a “combination of self-assertive and integrative.” Panel members then briefly explained why they responded the way they did to the preceding questions. Five categories were identified and the category that indicated the largest difference between what they actually observed to the behaviors that were most effective was the “self-assertive” to the “combination of self-assertive and integrative” category, with 29.4% of the panel members responding this way. Question 11 found that 88.3% of the panel members either agreed or somewhat agreed with a theoretical explanation about the relational and interdependent nature of solving today’s problems. In the final optional question, four themes were

identified from the eight comments submitted and they were interesting but did not significantly inform the study. Numerous participant quotes were included in the Round Two feedback summary sent to panel members so they could reflect upon the perspectives and ideas of their peer executives.

Third Round Data Analysis

Round Three proved to be a bit of a challenge yet interesting because the researcher decided to allow panel members who missed Round Two the option of participating in the third round, along with the 18 consistent panel members that submitted all three rounds. Of the 8 additional panel members, 5 chose to complete the entire questionnaire and 2 partially completed the questionnaire. Since it was critical to distinguish the results of the consistent group from the additional group to ensure the integrity of the data, the responses for each item needed to be calculated and categorized separately (Appendix L).

In the first question, the percentage of participants who rank ordered the importance of each challenge item (which had been identified and rated in the first and second rounds) was calculated to obtain a sense of the group's perceived priority. In the data of both the consistent group and the comprehensive group (the panel members that completed all three rounds plus the additional panel members that did Rounds One and Three), "attracting, retaining, and motivating employees, especially top talent" was the top challenge identified, with 78% and 72%, respectively, of the panel members ranking it a 1 or 2 on a ranking scale of 1 to 6. Question 2 found that four significant learning experiences (identified in the second round) had a consensus of 61% or more in the group of consistent panel members, as well as the same four items reached a consensus of at least 64% in the comprehensive group's results. In Question 3, both the consistent group and comprehensive group once again reached consensus on the same two items about optimal time periods to prepare leaders, with the two items receiving a 1, 2, or 3 ranking (on a scale of 1 to 7) from 83% and 61% of the consistent panel members and 84% and 68% of the comprehensive panel members.

From the responses submitted to the open-ended Question 4, eight main categories emerged about ideas to promote meaningful organizational learning. All the suggestions were included in the compiled results so the expert panel members could possibly gain new insight on ideas to implement. In Question 5, 93.8% of the consistent panel members and 90.5% of

the comprehensive panel members agreed with the theoretical concept described about an “economic company” and a “learning company” and five categories emerged from the comments submitted. Questions 6 and 7 once again revisited the learning and communications approaches previously identified and rated by the panel in the first and second rounds. The intention was to have the participants reflect upon the top rated learning and communication approaches (which had consensus), and the data found how often the panel members observed these approaches being practiced in their organizations. In Question 8, 82.6% reported that “it would be very helpful” to a team’s overall effectiveness if the learning and communication approaches were explicitly discussed, encouraged, or rewarded.

Question 9 indicated that 66.8% of the consistent panel members and 70% of the comprehensive panel members observe or mostly observe adaptive behaviors in their organizations, and six categories emerged from the comments expressed about why people either embrace or resist change. In Question 10, panel members explained their purpose for leading and the responses revealed that 50% of the consistent panel members and 52.4% of the comprehensive panel generally expressed a greater focus on “others” while 31.3% of the consistent group and 28.6% of the comprehensive group generally expressed a greater focus on the “goal” itself as being the primary motivator for their purpose. Also, 18.8% of the consistent participants and 19% of the comprehensive participants explicitly expressed a focus on both the “goal and others.” In the last optional question that gave panel members a chance to freely comment about the topics in the study, 6 participants responded to this question and no particular pattern emerged. One participant—who was actively engaged throughout the entire process—expressed he would have liked a conference call explaining the approach and rationale before the iterative questioning began, and he would have liked to have given input on the questions and topics chosen. Most participants used it as an opportunity to express their enjoyment of the process and their interest in participating in similar learning forums in the future.

Background Questionnaire

The background demographic data were summarized with actual numbers and percentages of panel members based on the information reported. In some cases, corporate

data were also used to give more perspective and comparison on gender, regional, and line of business representation (Appendix N). The question of nationality or ethnicity was open ended to give participants the opportunity to identify themselves as they wish. This was also juxtaposed with the office locations where panel members worked around the world. The data were reviewed for interesting patterns or further insight on the panel. The responses revealed an extensive amount of experience, on average, of working in the corporate world and in leadership positions, as well as a meaningful amount of experience at Oracle, especially given the relatively typical, short tenure of high technology employees at one company. In total, 12 different countries and 20 different cities were represented on the expert panel. At the conclusion of the questionnaire, panel members were given the opportunity to reveal their identity to be associated with this study. Of the overall panel, 23 of the 26 participants agreed to share their name with the other participants. In addition, 19 of the panel members indicated their interest in future discussions related to this study and 5 indicated they would possibly be interested.

A final executive summary with this data and the results of the Round Three questionnaire were shared with the entire panel via electronic mail on March 13, 2007, after the study was completed.

Evaluation of the Delphi Method for This Study

The advantages of the Delphi method in this study were consistent with those noted in the literature. There were several advantages to employing the Delphi, combined with the ability to use online questionnaires, to explore the study's research questions. First of all, this approach enabled Oracle's executive leaders (from multiple lines of business) who were geographically dispersed around the globe in 20 different cities, from Munich to Dubai, and from Rio de Janeiro to Beijing, to participate. Second, the anonymity afforded by the method permitted panel members to openly and freely express their perspectives and experiences. For the most part, panelists wrote thorough and thoughtful responses. This allowed for a variety of input to be heard because a particular individual or group was unable to dominate the virtual discussion, as is sometimes the case in face-to-face settings.

Third, this method truly demonstrated its effectiveness as an educational tool, as literature on the Delphi technique suggests. The positive and earnest (and sometimes

entertaining) comments from participants on the Round Three questionnaire, in addition to nine direct messages the researcher received via electronic mail, seemed to reveal a sincere understanding of the value of such a forum. One panel member summarized many of the comments well, “This is in itself a great learning opportunity. A leadership series where managers have the opportunity to think and to have dialogue at this level would be very rewarding for our leadership individuals and teams.”

Fourth, the ability to send the panel members feedback summaries after each round of questions seemed to keep them engaged and motivated, for the most part. Even though there was some attrition from the first round to the second round (most likely due to the timing in the business cycle and busy schedules), it was interesting to observe 7 of the 8 panel members who missed the second round return to submit the third round questionnaire when they were given the option but told they were not expected to complete it. And, several of these 8 participants wrote the researcher to apologize for their unavailability during the second round. Finally, the ability to begin the study with broad, open-ended questions (without any theoretical constructs) enabled the researcher to observe if panel members were actually operating in a complex system, and once verified, it was possible to share more theoretical frameworks which encouraged panel members to give more meaningful reactions and suggestions. Getting to such depth would have been impossible if it had not been for the iterative questioning nature of the Delphi method. Hence, it seemed like higher quality ideas and comments (and even challenges to some of the concepts) were produced and may actually be useful to informing practice or serve as a foundation for more in-depth future research.

There were also many advantages to using the online survey tool and electronic mail, and the use of such technology seemed to be an ideal fit for the Oracle environment. Panel members could complete their online questionnaires at their own convenience and the fast transmission and quick turnaround times for questionnaires, feedback, and compiled panel responses kept the participants interested. Through the active use of the survey tool, the researcher was able to carefully monitor progress on the questionnaires and easily send friendly reminder and thank you notes based on the master submission list. The ability to download the data in various formats also enabled the researcher to concentrate more on the actual content received rather than the tedium of collection methods. The rich qualitative data

received through the use of numerous and iterative open-ended questions elicited thoughtful opinions that purely quantitative methods would not have produced. This approach also enhanced validity, and group consensus was reached on many ideas expressed. Interestingly, the Delphi method seems to mirror many of the characteristics of complex systems themselves with an active reliance on the relational aspects of solving problems in an integrated way and involving people to learn from one another and build upon each other's ideas. Ideally in both the Delphi process and complex systems, novel concepts are encouraged and allowed to emerge and the outcome can be uncertain or unpredictable. Given all this, it is hopeful that data from studies such as this can contribute to a very limited body of practically applied knowledge in the field of complexity.

Disadvantages of the Delphi Method for This Study

It was not surprising that a few disadvantages to using the Delphi method for this study also surfaced. The amount of follow-up required with panel participants was quite considerable and involved frequent and consistent communication with participants throughout the entire study. While the recruiting, nomination, and consent process went smoothly, it was inevitable that holiday schedules, business cycle times, and senior leadership changes in certain lines of business were varied among such a diverse group of executives spread across the globe. Furthermore, the researcher tried to maintain a tight timeline in the distribution, collection, and summarizing of data, yet data collection and analysis were lengthy processes as compared to a one-time survey distribution. The benefit to all this, however, was that it kept the researcher closely and actively involved with both the panel members and the data on an almost daily basis for several months.

Other disadvantages were realized through the researcher's maintenance of personal notes and a subjectivity journal intended to record biases, questions, and concerns. Given the "open" nature of the Delphi method, it was a fine balance between maintaining a feeling of participant ownership by following up on the ideas that emerged and guiding the focus in subsequent questionnaires to look at concepts that were most directly related to complex systems. The researcher may have overdefined some concepts in the desire to gain more in-depth feedback. Yet, the steps of sending data summaries to the expert panel after every round of questions and having an external reviewer examine every round of compiled

feedback helped the researcher maintain a greater level of objectivity. Knowing that the data summaries were being sent to fellow employees (since the researcher is also an Oracle employee) inspired the researcher to be as neutral as possible when sharing results, so as not to be judgmental when sharing participant responses in relation to theoretical models. For example, since the researcher clearly has an interest in characteristics or elements of complexity, every effort was made to represent more rationalist elements in an equal light. The external reviewer was invaluable in this regard to ensure language and descriptions were fair and balanced. The researcher was also aware that maintaining objectivity in the facilitator role was important and sometimes panel members would personally contact the researcher to express their gratitude or interest in the topics, so the researcher tried to take a friendly yet neutral and professional approach with every interaction.

Finally, there are always potential disadvantages when it comes to using technology. In all but one instance, the online survey system and electronic mail communications were exemplary. Both were trusted tools that had been used extensively in this environment; however, during the data collection phase of the Round Two questionnaire, the researcher realized there was a technical glitch with either the survey tool or the server or both. The researcher sent a second reminder message with the embedded online questionnaire link to the panel members who had not yet completed the questionnaire. Then, this reminder message was “bounced back” to the researcher 6 days after it had been sent and the questionnaire had been closed, so it seemed as if the panel members never received it (although it had been delivered through the researcher’s email test account just fine). Of course, these panel members had already received the initial questionnaire message as well as one reminder message; however, busy executive schedules often require another gentle nudge. This technical glitch may have contributed to why 8 panel members did not complete the second round of questions. (And, then, 7 of the 8 reengaged in the third round of questions, although the researcher was cautious to keep their input separate from the consistent group of 18 to ensure the integrity of the data.) Overall, the advantages of the online survey system and electronic mail considerably outweighed the disadvantages in this study.

SUMMARY

The goal of this study was to begin to explore how leaders function in and observe an actual complex system and to generate or identify emerging elements and possible leadership guidelines, especially from a cognitive perspective, in the nascent field of complexity. The study was designed to understand the primary challenges leaders face and identify the possible characteristics, methods, and worldviews that enable leaders and complex systems to operate effectively. The Delphi method was determined the most appropriate technique to examine the study's research questions given the geographically dispersed subject pool and since the inherently complicated concept of complexity theory had not been explored in many practical, complex corporate environments. Twenty-six nominated executives from multiple Oracle business units representing 12 different countries participated in the study; 18 of those executives completed all three rounds of the study and 25 of them completed the first and third rounds of questions. The Delphi process included three rounds of open-ended questions, combined with ratings and rankings of previous response items, and one background questionnaire to collect demographic information on the panel members. The entire study took approximately 3 1/2 months to complete.

Chapter 4 summarizes the key findings of this study by research question and subresearch question. The findings share the expert panel consensus on ideas considered during the three rounds of Delphi questionnaires and the background questionnaire.

CHAPTER 4

FINDINGS OF THE STUDY

INTRODUCTION

The purpose of this study was to explore if executive leaders observe and experience elements of complexity theory in an international corporation, Oracle, and how they describe emerging leadership elements or behaviors and employ cognitive skills as a means to advance the organization's overall effectiveness. The study also examined key challenges experienced and what executive leaders believed were the most important learning and communication approaches to being an effective leader of a complex system. In addition, participating executives expressed worldviews and leadership philosophies helpful to navigating complexity and provided suggestions on significant learning experiences and optimal time periods for future leaders to be developed. The Delphi method was selected for this study because it allowed for an exploration of perspectives from a geographically dispersed panel of Oracle executives on a concept with limited research, especially from a cognitive perspective, completed in practical, corporate environments.

This chapter highlights the key findings of this study. The findings reflect the group consensus of an expert panel of 26 vice presidents (or above) who were working for Oracle throughout the world in 2006 and 2007. This chapter is organized by the four major research questions and the research subquestions that guided this study. The data reported reflects information refined through three rounds of iterative questioning. This approach included identification and categorization of emerging themes from written text, ratings of these items to determine possible group consensus, inquiry into whether participants actually observed behaviors they recommended, and a final participant ranking of the key challenges experienced. Panel participant quotes are shared in this chapter to illustrate the variety of opinions and perspectives that exist and to provide examples of themes and patterns that emerged in the Delphi process.

Background information on the panel members is also provided at the conclusion of these key findings. This information was collected by a demographic questionnaire that was

sent to panel participants at the beginning of Round Three and was incorporated with company-reported demographic data that the researcher gathered from Oracle's human resources department.

KEY FINDINGS

Research Question 1: What elements of complexity theory, if any, do expert leaders observe and experience in a complex organization?

Throughout this Delphi process, expert panel members consistently expressed their experience with or observation of elements and characteristics of complex systems when questions that indirectly covered complexity aspects were posited to them. First of all, it was important to establish if panel members were actually working in a complex environment without presenting any of the theoretical concepts and leadership behaviors associated with complexity theory. The extensive data collected, in the form of written text, revealed that panel members were relatively astute and aware of the complex dynamics of their environment and some gave particularly insightful explanations of the challenges faced and why things function the way they do.

Research Subquestion 1.1: What stories or critical incidents do leaders use to describe the challenges faced in a complex working environment?

In the first round questionnaire, 22 of the 26 panel members seemed to describe characteristics of a CAS when they were asked to explain significant work challenges they experienced. The researcher examined the work challenges based on the seven "generally agreed upon principles" that the Santa Fe Institute (Holland, 1995) published about CAS behavior (as defined in Chapter 2). It is possible and likely the other work challenge examples provided may also contain CAS behaviors but just may not have been explicitly expressed. Because of the promise to preserve anonymity, the researcher was careful not to share descriptions that might be identified by others. The following examples reflect the types of issues presented by the panel members and the honesty with which they articulated them:

Our organization has faced rapid growth within the last two years. Most of this growth has also happened in a different geography. The challenge we faced was the effective development and delivery of projects without significant overhead. Here's what I did to reach an outcome: enabled team leads to make their own decisions; made myself available at hours that work for the remote location to be

the sounding board for decisions; communicated extensively. I am, for the most part, satisfied with the process and outcome. We have been able to deliver key projects and have added key functional dimensions to the product's capabilities. Given a clear business advantage, a complex environment can be made to work if one is determined and flexible.

Blending together the [acquired company] and Oracle teams, against a backdrop of an uncertain future, was a great challenge. I personally invested very significantly in taking a special interest in the acquisition activities. Until reorganizations were agreed, I invested very heavily in communications, formal and otherwise, to keep staff apprised. I think we did as good of a job as possible in managing the uncertainty, though I remain frustrated that much of the uncertainty could have been removed sooner [with timely decisions not in my responsibility] . . . From this experience, I have learned that significant uncertainty generates significant (possibly otherwise avoidable) attrition. While you can try to manage through this, I believe more firmly now that the most effective remedy is to remove the uncertainty as quickly as possible.

A significant work challenge has been to find the right consulting skills to deliver our services. The resource market in India is currently very hot. Good skills are in high demand and in short supply . . . One key action we took was to create a work environment where people would like to stay and work instead of managing this only through salary increments. We have limited control over salary increments. We gave significant focus on all other people aspects, such as talent recognition and management, rewards and recognition, career development, HR policies, mentoring, etc. Another action we took was that if we cannot find skills in the market, we decided to create skills internally. We started a resource incubation program where we hire junior but bright resources and put them through extensive 4-5 months of training plus an on the job learning program. We also hired people experienced in alternate fields and trained them in our products. We also started an extensive management development program to build leaders within the organization. Overall the results have been quite satisfactory. My group has the lowest attrition in the industry and has generally solved the problem of finding the right skills. The learning from this process is that we will always have challenges and roadblocks but we need to constantly keep looking for alternatives and take risks and results will show up.

We had a product issue that was causing problems. We had to put a plan in place to deal with the problems that included: firstly, managing the customer issues on a real-time basis and making sure customers understood that we are there to address their problems. Secondly, we had to put a plan in place to address the issues in the upcoming releases so that customers could upgrade to a release that works much better. Thirdly, we had to put a program in place to help the customers upgrade to the new release. All of this had to be done by working across a large part of the company from field sales to development. I was generally satisfied with the problem solving process although we are not completely out of the woods yet, but we have enough evidence to suggest that we are addressing the problems. The one thing that was interesting in this experience was the fact . . . it took months for us

to understand the breadth and depth of the problem. In hindsight, we could have done a better job of proactively getting to the bottom of the issue rather than watch it unfold.

Managing the acquisitions of multiple companies has been a challenge . . . taking smaller companies and integrating them into Oracle's business practices, culture, etc. and keeping the stars, growing the team, and improving their rate of success in the marketplace. I was responsible for integrating the various sales organizations in the Americas. In addition to working to keep the "stars" I also brought in new talent from outside, who did not have any political affiliations with any of the acquired or acquiring companies. We all had the ability to start fresh. I also instituted a tremendous amount of training on Oracle practices and how to work successfully inside of a large organization. Most importantly, I learned that open, honest communication very often is a key driver of employee loyalty. If you tell them the "why" of a particular policy, they are more apt to adhere to it versus simply dictating to them.

It was a challenge to develop an organisational focus on new services as a result of Oracle acquisitions and opportunities in the market. I made a case to describe the business opportunity and the need for organisational change to address that opportunity. I did this to set guidelines for my management team and to gain their interest. I then worked with my team to develop a list of criteria that the new organisation would have to meet to protect what was good about the existing business and what was needed to develop the new business. I then asked the team to develop three options for the new organisation. I reviewed the options and steered the decision making to the option that I believed would be best. The process to contribute success criteria worked well, but the final step to develop options for a new organisation was less so. It needed a lot of personal input to get to completion. The problem with the second part of the exercise seemed to be that some members of the team felt threatened by the change in the organisation. They could see the benefits but were uncomfortable with the changes to their own roles. This emphasized the need to drive change from the top down, to maintain momentum, and to ensure team members could see their roles in the future organisation.

My organization previously managed two programs. Both had good brand recognition and traction in the market. It became clear to me, however, that by pushing two programs we were accidentally hurting ourselves. In this era of cognitive overload, it is easier for customers, the press, partners, etc., to understand, promote, and remember one comprehensive program vs. two smaller, niche offerings. My team decided to merge the two programs into one. While we knew that customers would be happy with the change, we were somewhat concerned with how the change would be perceived internally. Often times, managers think that two programs mean that you need a bigger team, more budget, etc. I questioned if my resources would get cut if I consolidated my offerings. This strategic decision to merge turned out to be very, very positive. This was the case for customers and even internally. It solidified my belief that, if you simply do the right thing as a leader, good outcomes will happen.

Furthermore, in the Round One questions, panel members also gave their perceptions on the greatest challenges to effectively leading in today's work environment. Four main categories (with multiple subcategories within each of the four main categories) emerged from the responses the panel submitted: (1) global, virtual, multicultural challenges; (2) challenges related to human skills, attitudes, and cognitive capacities; (3) challenges related to collaboration and teamwork; and (4) challenges related to the business industry or company environment (Appendix G). These panel-generated categories were then applied to every significant work challenge, including the preceding examples, described by the participants. While it is difficult to have mutually exclusive categories and, certainly, each work challenge could fall into more than one category, a primary category was carefully determined for each challenge to help get a general sense of the landscape. Of the 26 work challenges submitted, 6 were primarily global, virtual, or multicultural working challenges; 6 were related to human skills, attitudes, and cognitive capacities; 9 were related to collaboration and teamwork; and 5 were related to the business industry or company environment.

To further understand how panel members observed and experienced their environment, panel members were asked to rate (by level of importance) the most frequently reported subcategories of challenges (from the four main categories) in the second round of questions (Appendix J). The results revealed a panel consensus on 8 of the 13 challenges and, interestingly, 4 of them came from the human skills, attitudes, and cognitive capacities main category; 2 of them were from the collaboration and teamwork main category; and 1 each was from the global, virtual, or multicultural main category and the business industry or company environment main category. The 8 challenges are as follows:

- Attracting, retaining, and motivating employees, especially top talent (human category)
- Collaborating and operating effectively across multiple lines of business and disciplines and thinking from other perspectives (customer, lines of business, or coworker perspectives) to enhance overall organizational effectiveness (collaboration category)
- Developing or finding (cultivating) managers with strong leadership skills (human category)
- Providing clear direction and being able to effectively connect with virtual team members distributed across time zones (global category)

- Ability to process and filter extensive information to make appropriate decisions (human category)
- Cognitive agility to make the complex simple and navigate uncertainty (human category)
- Communicating and delivering value to customers and having a balanced focus between products and customers (business category)
- Managing and producing results with employees and virtual teams that do not directly report to you (collaboration category)

In Round Three, participants were then asked to rank order the challenges in order to get a sense of what the panel perceived to be most important. While the panel agreed on the importance of the preceding challenges, “attracting, retaining, and motivating employees, especially top talent” was the only challenge clearly ranked as more important than the others, with it being reported as a 1 or 2 by 78% of the consistent group (panel members who completed all three rounds) and 72% of the comprehensive group (consistent group plus the additional panel members who did Rounds One and Three only). Appendix L contains rank ordering percentages for the challenges and indicates that consensus was not reached on a precise ranking of importance on the other items.

The fact that panel members had differing opinions on the exact importance of the remaining challenges is not surprising given that executive leaders are faced with multiple challenges regularly, and one particular challenge might be at the forefront of their mind during a certain time while another might be more in their consciousness at another time depending on various factors. Yet, what seems most interesting about this finding is that panel members believe their primary challenge has to do with human-related matters, specifically, employing and engaging capable people. While the category “attracting, retaining, and motivating employees, especially top talent” is broad in itself, it actually subsumes many of the other challenges identified. And, of course, while all challenges are somehow connected to humans, it is curious that four of the agreed upon challenges happened to fall into the main challenge category of human skills, attitudes, and cognitive capacities and that two of the agreed challenges were related to collaboration and teamwork. Given all this, it is useful to pause and recall the CAS principles and paraphrase them into human terms (as described in Chapter 2):

In a system where agents (humans) interact incessantly, it is the aggregate behavior—which is nonlinear—we should try to understand. The agents (humans)

are numerous and diverse, operating in a complex web of interactions; and the patterns are not accidental because the system reorganizes itself if one agent (human) is removed. The system's aggregate behavior exhibits continual novelty, and the agents (humans) use their internal models or schemas to direct their behaviors.

So, in many ways, it is not a surprise to discover that human-related matters are at the center of most complex challenges and environments. Whether it be about people feeling uncertain about a future outcome or the depths of thinking that must be delved into to solve problems or the questions of how to keep capable employees engaged, panel members seemed to illuminate elements of complexity that could then be pursued more deeply.

Research Subquestion 1.2: What stories or critical incidents do expert leaders use to illustrate and describe their complex working environment?

As the key challenges expert panel members faced became better defined and the complexity of the environment was established, participants were asked to reflect further on the nature of their work challenges and explain if they agreed or disagreed with a theoretical concept about the relational and interconnected nature of problems and systems in Round Two (Appendix J). The results indicated 88.3% of the panel members agreed (and the other 11.8% did not explicitly agree or disagree). In addition, many participants seemed to thoughtfully express how this relational concept resonated with them and revealed more about how they perceive the dynamics of their work environment. Some panel members had a slightly more philosophical perspective:

I am a very strong believer in systems thinking and systemic problem solving. I try to take a step back when considering a problem to understand the symptoms, the inputs, and the processes that affect the results that are being seen. I truly believe our systems are perfectly designed to deliver the results we are getting . . . therefore if we are not satisfied with the results, we need to rethink the system.

I agree that virtually everything is interconnected and few "living systems" stand in isolation. I think that we tend to be tactical and focus on the urgent vs. the important and in our zeal to produce a revenue number or deliver a project; we sometimes ignore the other networked components. I have always been open to and actively interfaced with all of my virtual teams. You cannot be a lone wolf and lead.

I agree because I believe that at the end of the day in management and business we are first and foremost dealing with human beings and all of the good and bad that comes with that. I believe 90% of the battle is in touching the right aspect of people in order to get them to behave the way you would like them to.

I agree. The world is getting more complex because of globalization while we might lose sight of local practices and issues. Our organization is getting more complex not only because of globalization but also change in organization structure due to product scope and organization scale. They are all interconnected and related with each other. They cannot be understood in isolation. This concept will require an integrated leadership style.

From a leadership philosophy and especially an Oracle environment perspective, I 100% agree. If Oracle could get the right people to work on relationships, we would be the most successful company in the world.

Some panel members had a slightly more pragmatic perspective:

This presupposes that leaders can or do make the time to reflect on these issues. The volume of work and pressure to achieve short-term objectives reduces the time and energy to see the bigger picture, especially the impact on future generations. In companies such as Oracle with an inspirational leader, there is almost an upward delegation of this broader view to that leader and a belief that he has the “answer.”

I fully agree to the concept. However, I do not see that this fully applies to the challenges I currently have as a leader. From my point of view, there are decisions that have to be made very fast. These are perhaps more of an operational kind. I believe this concept applies more to very strategic decisions that very often impact the whole eco system.

I agree—and I think it’s clear how it applies to leadership and work challenges—Oracle is not a small company selling simplistic products—we’re very big and selling sophisticated pieces of software that need a lot of factors to work together to get the best level of success.

I agree and from very local environments or offices, we are going more and more to global organisations and virtual teams. The close working relationships will go away and are exchanged to technology relationships (e-mails, web-casts, etc). The company/office culture is going away.

I agree that many factors of interconnected things in life have an impact on our decision, but at the same time if all factors are to be analyzed, decisions will never be made. One needs to be pragmatic, take the most important factors into consideration and move forward. One needs to be flexible that if the decision has harmful effects on parts of the organization that she/he failed to analyze, then every rule has an exception. The mistake that global companies make sometimes is the broad-brush concept where a decision that is good for a large market like the US is enforced on all parties without the leaders willingness to understand the impact on others and without the flexibility to accept exceptions.

It seems evident that most panel members understood the interconnected and relational nature of their work environment and possibly even implicitly realized this is a critical element of a complex system. Yet, when the description from Senge et al. (2004) about

deeper awareness and learning in the U Theory (as defined in Chapter 2) is considered, it is unclear to what depth panel members—on a whole—were actively “aware” of the variables in the environment. This is not surprising given that the *Presence* authors found that most large organizations—whether they be corporations, governments, or schools—were not conscious of the deeper level of awareness and tended to operate with a limited, reactive type of learning. It seems worth reporting, however, a story that 1 of the panel members chose to share in the Round One optional question about organization dynamics:

Some months ago we held a group meeting to set up the goals for our next quarter. When we started up, every single member of the team was negotiating her/his goals in a cautious way (as they always do), trying not to fail. Then I challenged them to change the game, and define what we wanted (our dream) not what we believe is possible. During the process I had support from Human Resources and an outside coach and it was a tough meeting, but the process went well. Finally we defined some crazy goals and many people laughed at the end of the meeting. The quarter ended up being our best quarter ever, with results even higher than our best predictions. Was it an accident? We will see in the near future.

It is difficult to measure to what extent this type of U Theory learning—deep observing and listening beyond one’s preestablished mental frameworks to allow something new to come into reality—is occurring. However, there may be glimpses that it can exist.

Research Question 2: What elements or associated behaviors of complexity theory, if any, are leaders employing—implicitly or explicitly—in their complex working environment?

Given the complexity the expert panel members expressed in their work challenges and daily environment, it was relevant to explore how leaders function in this complex system and if the organization is consciously aware of the behaviors it practices and understands them in aggregate. It is difficult to make visible the cognitive architectures of people in any organization; however, considering the perspective of script-based theory (Schank & Abelson, 1977) as described in Chapter 2, it might be possible to ascertain “sketches” of some common organizational behaviors by exploring the philosophies, observations, and ideas of panel members.

Research Subquestion 2.1: How do leaders approach organizational planning, goal setting, and decision making?

Some insight to how leaders approach organizational planning, goal setting, and decision making was already indicated in the significant work challenges that panel members

described. Yet, to get a more holistic understanding of panel members' beliefs, they were asked to describe their "leadership philosophies" in Round One (Appendix G). Many panel members submitted contemplative, meaningful responses, and the researcher carefully determined that it would be helpful to consider these "philosophies" from the perspective of Physicist Fritjof Capra's (1996) model of "self-assertive" and "integrative" behaviors or tendencies as defined in Chapter 2. Out of the 26 "leadership philosophies" submitted, 8 seemed to be written about slightly more self-assertive behaviors, 12 seemed to be written about a combination of self-assertive and integrative behaviors, and 6 seemed to be written about slightly more integrative behaviors. It is possible and likely that the leadership philosophies submitted may contain more "self-assertive" or "integrative" tendencies, yet, for purposes of this study, only what was explicitly written was considered so as not to make incorrect inferences. The following examples of participant quotes helped to propose to the panel a theoretical model to see if it would be helpful or unhelpful in the real world of leadership.

Example philosophies that seemed to be about slightly more self-assertive behaviors include:

My leadership approach is results and excellence-oriented. I value fairness, focus, and being positive across my organization. I expect this of myself, and of all who work with me. I tend to be motivating as a person, and am usually able to engage my team to offer their best efforts, while keeping things simple in the process so we all maintain a healthy work-life balance.

I lead by example. I have held virtually every [functional] job that you can have at Oracle from an [individual contributor role] to an [executive]. I know what it takes to be successful and I do it every day. I set the vision, hire the best possible talent and let them run their businesses. I listen, I support, I delegate responsibility and I inspect what I expect. I treat others fairly and uphold the highest standards of character and integrity.

My philosophy is to manage more downward than upward—and be knowledgeable about who is doing what on a regular basis. I believe the most important thing a manager can do is to hire and retain the best people—especially a direct staff and work hard to make sure they are happy and motivated.

Example philosophies that seemed to be about a combination of self-assertive and integrative behaviors include:

Generally, I like to think that I lead by coaching—offering advice and encouragement to my team, allowing the managers/leaders on my team to make decisions as appropriate and offering my advice when I feel it's needed or when

it's solicited. A critical aspect of leadership is decision-making. I offer these thoughts on how I prefer to approach decisions:—make decisions based on facts & critical analysis—invite opinions & dissenting views during decision-making process—stand behind decisions when final decision is made but stand prepared to reverse decisions if the results ultimately don't support the initial direction.

I feel I am a steward of the organization. My role is to help the people in the organization be successful so that the organization will be successful. My role is to articulate a clear vision, one that can be shared by each member of the org. Once aligned the org requires enabling tools, process, management, and recognition . . . it is my responsibility to ensure my leaders understand this role and can be successful fulfilling their responsibilities.

Surround yourself with the best people. You don't know everything. You can't.—Listen to them and your customers with an open mind—Make the hard decisions, set the vision and fully support the team in execution.

Example philosophies that seemed to be about slightly more integrative behaviors include:

I see leadership as serving . . . we exist to support the people that work the actual process. Everything we do should be aimed at making these people more successful, empowered, etc. I connect with people and spend a lot of time building trust. I only exist because we need a leader for a team—not the reverse. That said, the leader needs to assume responsibility for strategy, direction, making required changes etc but should be done in a way that the team feels/is very much part of this.

I lead by example; motivate teams to work together. In today's complex work environment, teamwork is critical for success. Engagement requires effective communications and team motivation (team involvement instead of being told what to do). We also need to lead the way by taking ownership, working through the ambiguity, demonstrating our willingness to be part of the team.

Firstly, make sure you are enjoying your job and look forward to coming to work everyday. If that is not the case you will have a very hard-time motivating others. Second, make sure you lead by example. If you are not ready to do what you are asking others it would be difficult for other to follow you. Finally, be inclusive. If you want to surround yourself with people smarter than you then you need to make sure you are not overbearing. Make sure you let people be as effective as possible without letting your ego get in the way. Getting out of the way sometimes means letting someone make a mistake instead of trying to make sure you are always there to prevent it.

The leadership philosophies certainly gave more insight into how goals and plans are put in place and how decisions are made. It is interesting that the largest number of philosophies tended to fall into the “combination of self-assertive and integrative” behaviors. Indeed, when explaining this model, Capra (1996) notes that neither the “self-assertive” or

“integrative” tendencies are intrinsically good or bad; both are necessary and a balance is optimal. To explore this theoretical model further and to try to understand the panel’s deeper views about this concept, participants were asked in Round Two (Appendix J) to determine, in their opinion, which behaviors they observed most leaders “actually” practicing and then to also decide which behaviors they believed tend to be “most effective” (regardless of the proposed model). In both questions, a majority of the panel members agreed on their top responses. As for what they “actually” observed in most leaders, 58.8% observed self-assertive behaviors, 5.9% observed integrative behaviors, and 35.3% observed a combination of the behaviors. However, in what the panel decided were the “most effective” behaviors to use, 64.7% chose a combination of self-assertive and integrative behaviors, 23.5% chose integrative behaviors, and 11.8% chose self-assertive behaviors. To learn why panel members responded the way they did to these questions, participants were asked to briefly explain their responses to the preceding questions. Appendix J contains the example quotes for why panel members selected certain behaviors. Of those who “actually” observed a certain behavior and selected that same behavior as the “most effective,” the distribution was as follows: 5.9% chose “integrative,” 11.8% chose “self-assertive,” and 35.5% chose a “combination of self-assertive and integrative.” Only two groups of panel members changed from what they “actually” observed to what they thought was “most effective”: 17.6% of the panel members “actually” observed self-assertive behaviors yet believed integrative behaviors are “most effective” and 29.4% of the panel members “actually” observed self-assertive behaviors yet believed a combination of self-assertive and integrative behaviors are “most effective.” None of the panel members who “actually” observed “integrative” or a “combination” of the behaviors changed their minds to select “self-assertive” as the “most effective” behavior. It is not possible to conclusively determine how the organization actually operates overall; however, it is interesting to note that most panel members espoused leadership philosophies that leaned toward a combination of self-assertive and integrative behaviors and that a large percentage (88.2%) of the panel chose the “most effective” behaviors to be either a combination of self-assertive and integrative or entirely integrative. At a minimum, it could be stated that panel members agree that self-assertive behaviors—which tend to ascribe to more of a rationalist view (as defined in Chapter 2)—are not recommended as the only way for leaders to operate in complexity.

Research Subquestion 2.2: How do leaders approach changes in their working environment and organizational direction (caused by either internal or external factors) and adjust or not adjust to unexpected outcomes?

The work challenges and leadership philosophies, as previously discussed, gave indications as to how leaders currently navigate or should navigate changes in the environment. The panel's consensus on the importance of leaders being effective at change will also be highlighted more thoroughly later in this chapter. Throughout the study, panel members made numerous comments similar to the following: "Oracle is a very dynamic company. Every day of work is different and if somebody doesn't like change, they will find it a very difficult company to work for." In Round Three, participants were specifically asked if they observe adaptive behaviors in their organizations and why they think people either embrace or resist change (Appendix L). While the majority indicated they observed adaptive behaviors, the panel was slightly polarized at the two extremes (yes or no). The participants reported: 53.5% of the consistent group and 55% of the comprehensive group observed adaptive behaviors, 13.3% of the consistent group and 15% of the comprehensive group observed "mostly" adaptive behaviors, 6.7% of the consistent group and 10% of the comprehensive group observed "some" adaptive behaviors, and 26.7% of the consistent group and 20% of the comprehensive group did "not" observe adaptive behaviors. In addition, six main themes seemed to emerge from the explanations the panel members provided. Although panel consensus was not pursued in further rounds of questioning, it is worth noting how panel members articulated their opinions about adaptive behaviors, ordered from the most frequently mentioned to the least frequently mentioned:

- People resist change because they feel out of their comfort zone and are uncertain about what to expect so most prefer to stay with what they know which is less fearful.
- People resist change because they do not understand why the change is happening so clear and consistent communications about the reasons and benefits of the changes are important.
- People resist change because it is a risk and they want to protect their power or sphere of control and might be uncertain about what the change means for their role.
- People resist change if they have not been conditioned during their youth or development years to embrace it or take initiative.
- People embrace change if they view change as a learning opportunity and are typically optimistic, enthusiastic, and ambitious.

- People resist change because they are not involved in the decision making and may not feel they are valued or their opinion is heard.

Many participant quotes are included in Appendix L; however, the following panel member quotes exemplify some of these opinions:

Yes, I observe adaptive behaviors, but not as much as I would like to see. People in general don't like change because it leads to uncertainty, and they are afraid of that, one of the major challenges for leaders is to help people navigate through uncertainty.

There are some adaptive behaviors, but in general I think humans are averse to change as a first reaction. When forced into it, many times, they emerge on the other side better for it. But it's not something that many seek. The "comfort zone" of continuing to do what you always do, is easy. Change can be difficult and forces you to go on faith as to what can be on the other side. Where you are now is known, where you could be with change is unknown. Unknowing causes doubt and fear. And hence most people prefer to stay with what they know.

No, I do not see many adaptive behaviors. The issue I see most often is that we spend very little time, effort, money etc. on creating dialogue around the "reason" for change. We don't allow employees to understand how the change will benefit them. We instead introduce change by communicating the change process—step 1 will be completed by this date, step 2 by . . . etc. When animals learn and adapt it is to better their life, i.e. more food, more security, species proliferation, etc. We face change more often than not with no understanding or acceptance of the personal benefits of the change. In an organization with little trust, this will result in major resistance.

Overall, I would say yes. I now see adaptive behavior overall in my organization which was not seen 5 years ago. This is, in part, due to the many changes that have already occurred in the organization. I also believe it is that the vision and messages related to the direction we are moving have been consistent for many years and therefore people understand what needs to be done. You will always have some that do not want to change which is human nature. Doing something new is always hard.

The issue is that most people are not involved in the decision making process, so there is no commitment to the decision. A balance is required. If people feel that their opinion is heard before the change is made, they will be more likely to support the change. On the other hand, if the leader is going to wait until all opinions are heard, the change will take forever. So, it is more opinion seeking and faster implementation or less opinion seeking and slower implementation.

Many people in Oracle are adaptive—they have been employees for many years and are used to change. Individuals, who can think through change and identify a new or enhanced role for themselves, embrace change. For those who will be disadvantaged, or who cannot see that the benefits outweigh risk, it may be better to resist change. My view is that the non-changers are a minority in Oracle.

As expressed in the preceding quotes, many panel members seem to have a meaningful awareness about methods that encourage people to be more likely to embrace change: effective communication about the reason and benefits for changing, helping people navigate beyond their comfort zones, and involving people in the decision making. These are thoughtful suggestions. However, given the specific focus of this study, the researcher was curious if the panel also understood the cognitive implications, as described in Chapter 2, of adaptive behaviors. So, it was of particular interest when a few panel members made comments that seemed to illuminate their understanding of, at least tacitly, cognitive factors or script-based concepts that can impact adaptability. The panel member quotes include:

I think the ability to deal with change has to be trained from youth. Most parents are protective and that does not help their children to embrace change.

No, I do not see adaptive behaviors. For me, much is cultural. Almost all of the countries that I manage have a history of communist rule or substantial communist influence. This has stifled personal initiative and taught people not to extend/expose themselves—to “manage” their situation within boundaries that they can control. This is lessening as we move further from the communist era. In these countries so much is done by personal influence. In order to change, you have to break down the networks of influence that have been built over many years.

Most of the people who resist change or those who have gained certain powers with that organization and view any change as a threat to their power and control. However, certain sections of the people do embrace change because they constantly want to learn.

I think people resist change as the result of fear. Others embrace it because of the learning opportunity that it presents.

Based on the understanding of knowledge structures described in Chapter 2, people often tend to default to the scripts or plans (along with goals and themes) with which they are most comfortable when placed in ambiguous or uncertain situations. As Schank and Abelson (1977) remind us, “Understanding then, is a process by which people match what they see and hear to pre-stored groupings of actions that they have already experienced. New information is understood in terms of old information” (p. 67). This is efficient for the brain and comfortable for people, but it does not mean understanding of the situation is entirely accurate because many rely on past judgments and previous experiences without truly assessing a novel situation. So, when a person’s scripts are interrupted or result in an “expectation failure” (Schank & Abelson, 1977), it may cause emotional distress as the

person struggles to create a new script, but it does present an opportune time for learning and, if properly indexed, it gives the person an increased likelihood of retention and future application of the newly acquired knowledge. The panel member quotes that mention the significance of a person's "conditioning" and his or her "openness to learning" might be somewhat cognizant of the link between adaptiveness and knowledge structures.

Research Subquestion 2.3: How do leaders describe their personal learning style and information collecting process?

Throughout the three rounds of questioning, panel members were asked to describe their personal learning style and then asked to consider the learning elements that were collectively identified and determine how essential they were to their individual learning and the learning of their organizations. In Round Two, the panel reached consensus on the following seven essential learning elements or approaches:

- Actively learn from others by asking key questions, seeking multiple perspectives, or problem solving together
- Be open to new ideas and learning new things—view every problem as an opportunity
- Learn (in general) from each interaction with people (team members, boss, and/or peers)
- Learn (in general) from each experience, challenge, and the environment itself
- Actively learn by doing and from willingness to possibly making mistakes
- Be willing to be out of comfort zone when taking action and learn from mistakes
- Practice learning organization concept and regular leadership development initiatives with teams

In Round One (Appendix G), three main categories emerged (with subcategories within each main category) from each of the learning elements submitted by panel members: (1) formal learning through structured or planned activities and tasks; (2) informal learning through actions, people, reflections, and the environment itself; and (3) worldviews or mindsets about learning. Yet, in Round Two, when panel members were asked to rate how essential the most frequently reported items from each category were, it is worthy of noting that every item that gained consensus (which resulted in the above list) came from either the informal learning or worldview main categories. Further, the formal learning items were rated at the bottom of the list (Appendix J). While further study would need to be done as to exactly why this is, it

might be inferred that panel members do not see as much value in traditional, formal learning approaches or do not spend as much time thinking about personal and organizational learning that could be more structured. More discussion on this topic will be included later in this chapter.

In Round Three, the panel members once again viewed the essential learning items; however, rather than rank them, participants were asked how often they “observe” leaders in their organization practicing the essential learning approaches (Appendix L). Participants reported the following: 11.8% of the consistent group and 8.7% of the comprehensive group “consistently” observe these approaches, 47.1% of the consistent group and 52.2% of the comprehensive group “moderately” observe them, 35.3% of the consistent group and 34.8% of the comprehensive group observe them “sometimes but not often enough,” and 5.9% of the consistent group and 4.3% of the comprehensive group observe them “not at all.” Then, panel members were asked to determine how helpful it would be to a team’s overall effectiveness to *explicitly* discuss, encourage, and reward the essential learning and communications (which will be presented in the next section) approaches as the operating norms. A significant majority expressed “it would be *very* helpful,” with 82.4% of the consistent group and 82.6% of the comprehensive group reporting this. The remaining panel members indicated it would either be “somewhat helpful” or “little to no help.” None of the panel members indicated they were “uncertain if it would make a difference.” While panel members might view “learning” as a given expectation, such responses might reveal that they believe dialogue about or reinforcement of “learning” in their organizations is not currently high on the overall agenda.

Research Subquestion 2.4: How do leaders use stories to share information and encourage the exchange of knowledge within their organization?

Similar to the examination of learning, panel members were asked to describe their communication style and then rate the collectively identified communication elements that were essential to being effective. In Round Two, the panel reached consensus on 11 communication elements or worldviews:

- Encourage dialogue, ask questions, and effectively listen to cultivate trust and involvement
- Focus on high clarity and consistent messages to give clear direction

- Personally deliver and actively seek honest feedback
- Be open and transparent (and somewhat informal approach)
- Have personal humility and view employees at every level as equal and valuable
- Realize importance of being reachable and maintaining relationships (internally and/or with clients)
- Give direct and straightforward comments
- Share as much information from above as possible to provide insight on goals and big picture
- Be conscious of having positive tone (even with negative matters), providing inspiration, and/or recognizing and thanking team members
- Deliver or want factual information
- Active team involvement and engage in participatory style

When panel members first identified communication elements, three main categories similar to the learning categories emerged: (1) formal communications methods, (2) informal communication methods, and (3) worldviews about communications. Few items suggested by panel members fell into subcategories under the formal and informal main categories, while 84% of the comments were about worldviews. And, given the focus of this study, it was decided to focus on the worldviews about communications (which is what produced the preceding list).

In Round Three, the panel members viewed the top six agreed upon communication elements and were asked how often they observe leaders in their organization practicing the essential communication worldviews. A majority of the panel members indicated observing these communication behaviors “sometimes but not often enough,” with 64.7% of the consistent group agreeing and 60.9% of the comprehensive group agreeing. Panel members also reported “moderately” and “consistently” observing the behaviors, with 23.5% and 11.8% of the consistent group and 30.4% and 8.7% of the comprehensive group, respectively. None of the panel members selected “not at all” observed. As previously discussed in the learning elements, a large majority of the panel members believed it would be very helpful to their teams to explicitly discuss, encourage, and reward the essential communication elements. It is also interesting to note the similarities between the learning elements and communication elements that panel members selected as most essential.

To explore further what expert panel members believed about exchanging knowledge and sharing information, they were asked about the specific technique of “telling a story or scenario.” Participants commented on two aspects: how often stories were used in their organizations and if they believed stories helped to increase understanding with others. Panel members were spread across the spectrum when it came to how often stories were used: 8.3% said they are “regularly” used, 33.3% said “moderately” used, 25% said “not often” used, and 33.3% said “not used at all.” However, there were a majority of panel members, with 62.5% indicating they believed stories were “helpful” to increasing understanding with others. Other panel members were evenly split, between “sometimes helpful” and “not helpful,” at 18.75% each. Panel members also explained their thoughts about the use of stories, for example:

I view the use of “stories” to increase understanding and reinforce key messages as a good technique. However, I am not sure we should use this technique in all occasions; rather, I find it more effective when I use it occasionally.

I am convinced that telling a story is one of the key elements of effective communication in increasingly complex environments. From time to time, I hear these kinds of stories in our organization. However, I think it happens more on an individual basis.

“Stories” are not used very often in our organization. In terms of my opinion on this, I am not sure it applies well in a technical development environment. It is more appropriate for evoking emotions, which you can argue, could apply to our work environment but not as much as say in the political arena.

I think giving examples, or scenarios you went through before helps communicate the message more effectively. I use it often but not often enough. I still tend to “preach” sometimes, but stories or scenarios are better. But you also need a talent to effectively use “stories.”

A few panel members also seemed to have an implicit understanding of how stories help people “cleverly index” information, as described by Schank (1990) in Chapter 2, by giving information context so it can be understood and applied more easily.

People remember stories. Leaders need to provide a vision of something that matters to the people. Why should we grow? What’s in it for them? Stories of people who helped the company grow and grew with it are much more effective.

Stories are really important. We try to regularly get people to talk about “war stories,” wins and losses, at sales meetings and sales training sessions. On a personal level, metaphors are key to changing behavior. They provide almost a subconscious aid to gaining acceptance of a situation or required action.

Using examples or “Scenarios” is very useful as it puts some context to a discussion point. Especially when we are working in teams where English is not a first language, using examples will help to get the points across.

Stories seem to work if they have one central point that is unusual and helps people remember the whole story. At a training course 15 years ago an instructor said he was going to tell us a story which had such an interesting point in the middle that none of us would ever forget—and he was right!

Throughout the rounds of questions, it was interesting to observe how panel members seemed to identify a gap between the ideal ways of learning and communicating and what they “actually” observed. Of course, this is an expected outcome when the “desired state” and “current state” are contemplated. Yet, it does give insight into what “unconscious” internal models—as the seventh CAS principle suggests (from Chapter 2)—might be at work impacting the aggregate behavior of the complex system.

Research Subquestion 2.5: What assumptions do leaders make about their complex organizations?

Throughout the study, the researcher observed that panel members—in general—seemed to be consistently more comfortable or familiar with discussing communication concepts rather than learning concepts. For example, when panel members were asked to describe their personal learning style (approach), 2 participants expressed hesitation at the beginning of their definitions: “I am not sure I understand this question completely but here goes . . .” and “I assume this means how I learn . . .” This could be a result of the question itself being unclear. However, the researcher did not read comments like these in any of the other rounds of questions. Could it be that “learning” is not a common, explicitly discussed topic? Of course, leaders know the importance of learning, especially in a company and industry where intellectual capital is the only asset. However, maybe leaders assume people already know how to learn and underestimate the impact they can have on the learning that takes place in the organization. As described in Chapter 2, experts often cannot explain why they did what they did, because most people are not “metacognitively aware” of their own thinking and problem-solving process. And, experts—who are often promoted into leadership roles—have gained a certain amount of automaticity. So, it would not be surprising if leaders—in general—do not think much about the learning of others if they are not thinking much about their own learning.

Some panel members, as indicated in a few of the previous quotes, seemed to also assume that employees come to Oracle already having the necessary learned behaviors, mindsets, and mechanics to perform. Although, as a few panel members pointed out in their comments about adaptive behaviors, that is not always the case and these participants seemed to have a shrewd understanding of the importance of conditioning and prior experience from a cognition standpoint. For example, conditioning and prior experience could influence whether a person views change as a learning opportunity or a loss of control.

It is also well known that Oracle's culture expects, for the most part, employees to take initiative for their own learning and development. This somewhat organic and decentralized approach has benefits, such as giving employees flexibility to pursue various career paths and moving between business units to take on new roles. So, leaders could correctly assume learning is occurring; however, are leaders also assuming that knowledge and learning is being captured and exchanged in an optimal way so that the organization can benefit from it? Panel members may implicitly realize this is not consistently happening given that they reached a 100% consensus on the importance of the challenge "collaborating effectively across multiple lines of business and thinking from other perspectives" (Appendix J).

While other assumptions about the learning behaviors and expectations of their complex organizations have not yet been recognized, there are indications that panel members at least minimally realize they can play a role in helping their employees learn (which could be why they were nominated for this study). In Round Three, panel members suggested ideas and thoughts about promoting meaningful learning in their organizations. Eight main categories emerged and a significant number of the ideas generated fell into the two categories that complexity leaders can directly impact: manager techniques for sharing and exchanging knowledge and team techniques to encourage learning and development. Appendix L includes the entire list of panel suggestions.

Assumptions are not good or bad. All human beings operate on a certain amount of assumptions. As Chapter 2 indicates, the key is to make assumptions visible to others, particularly in leadership roles, to allow for corrections, modifications, or a shared understanding (mental models). In general, the researcher was interested to see the extent to which some panel members were aware of their environment and seemed to genuinely

articulate assumptions and expectations that illustrated at least an implicit comprehension of some behaviors that are important in complexity (even if it was not always the majority but just recognized by a few).

Research Question 3: What enables certain leaders to effectively guide others through complexity when other leaders are less effective?

Expert panel members identified several characteristics and skills that they believed were most essential to being an effective leader in today's work environment. After multiple items emerged from panel input in Round One, participants were asked to rate how essential the most frequently mentioned characteristics or skills were. They reached consensus on all 10 of the following items in Round Two (Appendix J):

- Ability to recognize and retain top talent and build strong team
- Ability to think big picture and motivate team toward common vision and goals
- Being an effective communicator and strong listener
- Ability to navigate complexity and ambiguity and lead change
- Ability to make bold decisions (especially based on facts/data)
- Building trust and credibility through integrity and humility
- Ability to balance competing priorities, focus, and get results
- Ability to manage and influence others, especially those outside your management responsibilities
- Being gracious, positive, energetic, and/or charismatic
- Being a quick and ongoing learner and problem solver

It is interesting to note that the top 2 items of “ability to recognize and retain top talent and build strong team” and “ability to think big picture and motivate team toward common vision and goals” both received 100% consensus (rated 4 or 5 by participants on a Likert scale of 1 to 5). This finding seems to reinforce what panel members clearly determined as the primary challenge after three rounds of questioning: “attracting, retaining, and motivating employees, especially top talent.”

In contrast, panel members also identified characteristics or reasons why leaders are ineffective. In the second round, participants were then asked to rate the ineffective characteristics based on what was most difficult for leaders to overcome. The following seven items reached consensus:

- Poor communications skills, including ability to provide clarity and motivate
- Team does not see leader as trustworthy and credible; leader is unable to inspire and motivate others
- Lack of ability to produce results and satisfied with mediocrity
- Inability to adapt quickly and simplify complexity for their team; not knowing when to change and learn/work through the complexity
- Lack of respect for employees and their value; not understanding and developing employees and inability to recognize talent
- Operating in isolation and leader unwilling to cooperate and spread responsibility across the organization
- Arrogance and/or leading by intimidation; too focused on their “management role” and not doing what they ask others to do

These results seem to further endorse the key challenges that emerged from the panel. It seems logical that an inability to overcome the preceding characteristics/skills could inhibit a leader’s ability to address the key challenges identified, as well as manage the uncertainty and ambiguity of a complex environment itself. Although this study is primarily focused on understanding the cognitive aspects of leaders who operate in complexity, it was also important to identify generally effective and ineffective traits. Overall, these findings seem to complement what has been discovered about complexity behaviors related to learning, communicating, and leadership philosophies. Even the “personality” elements expressed above (such as “lack of respect” or “not trustworthy” or “arrogance”) are connected to a leader’s ability to learn and communicate.

Research Subquestion 3.1: What would be a needed worldview for a leader to be a facile manager of complexity and ambiguity?

It could be posited, based on the findings presented so far, that a worldview reflective of the panel’s opinions is coming into focus. For example, 88.2% of the panel members indicated that either a “combination of self-assertive and integrative” or “integrative” behaviors would be the most effective in complex environments, and 88.3% of the panel either agreed or somewhat agreed (and the other 11.8% did not explicitly agree or disagree) with the concept that all problems cannot be understood in isolation and that relationships and interconnectedness (whether it be with humans or organizational processes) are fundamental. Given this, it is reasonable to suggest that panel members may tend more towards a complexity worldview than a rationalist worldview (even if behaviors do not

always match the proposed worldview). Building upon the results from the first and second rounds, it seemed useful to explore more of the reality of these concepts and models. In Round Three (Appendix L), panel members read an excerpt from Arie de Geus' (1997) *The Living Company* and were asked if they agreed or disagreed with the concepts of an "economic company" and a "learning company" and if there needs to be a new way of thinking about how companies measure success. A large majority, 93.75% of the consistent group and 90.5% of the comprehensive group, agreed with the concepts. Categories from their responses also emerged, including some skepticism if things should or will change. The response categories are listed below beginning with the most frequently mentioned comments:

- Yes, we need to think and/or measure success differently.
- Agree with the concepts above, but the economic measurement will or should not change.
- Agree with the concepts, but it's more about the rules or what is reinforced in companies and not because there is tension between the "economic" and "learning" concepts.
- Agree with the concepts above, but Oracle already survives unlike some other companies.
- Yes, we need to think and/or measure success differently, but it's a balance between "economic" and "learning" measurements.

Appendix L includes the panel comments. The following participant quotes are reflective of the comments:

I agree with the concepts. I believe companies and therefore leaders do little to enable the learning company. The focus on short-term results, reactive decision making, and the expectation that non-technical skills must be part of the employee's resume before they join our company really limits the learning company concept. When results are tightly managed from the top, employees and the company do not learn together.

I agree. Our strongest assets, especially in the software business, are our people. This is knowledge work. We succeed based on our skills at attracting, growing and retaining the best human talent. Growing includes training that helps people to change with the times and helps them focus on what is important in today's world, not what was important in yesterday's world. The longevity of organizations is directly based on their ability to adapt to change. And to do it early, and where possible to set the direction of change, not just react to it. Sometimes it's too late to react. That is why Oracle has been around for 30 years. Usually a step ahead and setting direction, not just following.

I emphatically agree with de Geus, companies that endure are those that learn, adapt and lead. I don't know that a re-definition of corporate success is required or practical—the P&L will continue to rule—but it is vital that employee success be defined, in part, by his or her ability to understand (learn) & adapt to their operating environment.

Our current measurement of success is and should be shareholder value—we are accountable to those who own the company and have invested their capital. As for a learning company, I agree that this is the path to success—the most successful ones are those who continue to adapt and evolve over time.

I agree with the need for companies to change but not with the arguments above . . . people execute to how they are measured. CEOs are no different and forced to focus on short term. The result comes at the cost of optimal long-term decision making and the success of the corporation. We have examples everyday at Oracle . . . this is why private equity is attractive for many leaders and why successful leaders are shy about returning to manage corporations . . . the environment forces them to make wrong decisions. This is different than the theory above (but I am all for theory).

Don't know if I agree or disagree, interesting that it comes from a guy that has been living on a natural resource (oil) and the distribution of it . . . It's all down to the rules of the game, it's like a football team that plays the game well but does not win anything. If you "win" by economic success it will never change.

I agree with de Geus' concept in general—that is there is an impedance mismatch between the economic goals of the company and cognitive nature of the individuals—but it is not the tension between the 2 things but rather the inability of companies to harness the power of cognitive thinking of individuals to align with the economic goals that is important.

There is only one measure at the end of the day for company success and that is the long-term earnings that it provides to the shareholders. The sources of these earnings can be capital, asset, or knowledge intensive, which is an advanced categorization of labor. At the end of the day, knowledge is created by people in an environment that nurtures such knowledge creation and captured over a period of time within the organization. Any organization cannot survive a massive walkout of knowledge workers and cannot replenish their inventory of them and make them sellable assets easily. Therefore, people management becomes an essential skill in a knowledge organization. This knowledge expands beyond the boundaries of the organization and complements who can add their own flavor. Sometimes, just knowing who to partner with in which space and why to partner with them is enough to create wealth. One of the strengths of Oracle that is not observed in some of the acquired companies is the willingness of Oracle people to share their knowledge and teach others. There is no fear of job loss or anything.

While 31.3% of the consistent group and 23.8% of the comprehensive group comprised the first category that "we need to think and/or measure success differently," the remainder of the panel members did not seem as supportive or hopeful about a new way to measure

success inclusive of learning—even though an overwhelming 93.75% (consistent group) and 90.5% (comprehensive group) agreed with the concept of a “learning company.” What is interesting in all of this is that panel members, for the most part, seem to have a shared worldview of complexity; however, it indicates that mutual agreement in concept does not necessarily translate into practical applications that might (or might not) contribute to more optimal outcomes in their espoused worldview. Once again, this is not a surprise—and continues to be a primary challenge—for this particular domain because a person’s or a system’s learning is considerably difficult to assess and truly effective measurement techniques of learning/cognition continue to consistently elude most organizations, whether they be elementary schools, universities, governments, or corporations.

Research Subquestion 3.2: How do leaders describe their desire to lead or purpose for leading a complex organization?

As previously discussed, panel members described their leadership philosophies, and while these explained the way they operate and perform with their teams, the philosophies also gave insight into panel member beliefs and their motivations for leading. To explore this in more depth, panel members were asked in the final question of all three rounds, “How do you describe your purpose for leading? In other words, what gives you meaning and gets you out of bed in the morning? Why do you desire to lead?” While Capra’s (1996) model of “self-assertive” and “integrative” behaviors seemed to be a useful perspective from which to examine the leadership philosophies, it did not seem appropriate while carefully reviewing panel members’ purposes for leading. Instead, two simple themes seemed to emerge—the purpose seemed to generally express a focus on “others” or a focus on the “goal” itself. Of course, it is possible and likely that a panel member’s purpose is equally motivated by a combined focus on others and actual goals. Certainly, the two are interconnected. Yet, for purposes of this study, only what was explicitly written was considered and the greater tendency was identified. The results indicated 50% of the consistent group and 52.4% of the comprehensive group tended to focus on “others,” 31.3% of the consistent group and 28.6% of the comprehensive group tended to focus on the “goal,” and 18.8% of the consistent group and 19% of the comprehensive group explicitly indicated a focus on the “goal and others.” Appendix L includes the panel’s purposes and the following quotes exemplify the sentiments of “others” and “goals”:

I like to see an organisation work well together. I like to work with a strong and dynamic team that is willing to go the “extra mile”—and I do like to lead people and a business and to reach results (business and human).

I like building things that work. I hope that people will enjoy being part of what we have all built together and enjoy its success. I learn from what I have done and believe that it is building my future.

I see my role as a leader in many different ways. I am a steward, a teacher, a coach, a manager, and a team member. This diversity is my motivator as it is all focused on helping the organization grow and improve.

My purpose is to lead teams to achieve common goals, as there is no single hero. Today’s environment requires teams to work together. My purpose is to ensure team alignment, fair rewards and recognitions. If we can do this, the power is amazing. We can make the impossible possible. That is job satisfaction.

I am not sure a true leader has a desire to lead. I think it’s people that are so eager to get to the goal, that they either convince people to join them or they just keep doing their thing and people just follow them. So I get out of bed to reach the goal I have set.

I have always been a very goal oriented individual with a strong desire for success. I love the action. I relish the fact that in our profession, we are always under scrutiny and must achieve very quantifiable results and do so every 90 days. It’s not for everybody! I like to teach and mentor. It is very gratifying to see young leaders take what I have given them, put it into practice, add their own expertise and ultimately become successful and lead larger and larger organizations.

When I believe in a vision, I am passionate about making a contribution to develop the strategy, lead a team, and help execute the vision. I am excited at leading a team and being able to achieve exceptional results. I like to help people get there most, unleash their potential and upgrade the team. I love being able to develop a growing and learning environment; I strongly believe it leads to success, happiness, and health.

I get out of bed because I have to be successful in everything I do. I have to become better everyday and I enjoy doing it. Failure for me is no option, but even if I fail, I will at least spare no energy to succeed. There are 1000 families that feed their kids based on our team’s success, thousands of customers that entrusted us to run their entire business, and I will do what it takes to make them all successful.

I am totally aligned when I lead. I have a passion for growth, learning, and expansion and thoroughly enjoy helping others experience these great opportunities as well.

A combination of the following: 1) Fear of failure (which is remarkable given my success but it still keeps me awake!) and the desire to be successful. 2) My purpose for leading is to “serve” . . . I read a little book once called “servant

leadership” (about a retreat at a monks monastery) and it changed my views on leadership forever.

I work FOR the people in my organization. The purpose of my title and office is to help them be successful. My role is to break down barriers and “move mountains” so my team can succeed.

Panel members did not explicitly mention the concept explored in Chapter 2, about some scientists and researchers bringing to the forefront the convergence of complexity science and spirituality, but this is not unexpected in a business context. Yet, several panel members did use language such as “servant” and “helping others” to describe their purpose and it was interesting to note that a “sense of purpose beyond oneself, for some greater collective good” (as discussed in Chapter 2) did not seem like a completely inaccurate definition—although it might not be an exact description. It is unknown how the seminal understanding of complexity—the sustenance of life—or Capra’s (2002) “breath of life” concept would resonate with panel members. Yet, it is interesting to see how panel members seem to be aware of themselves within the context of others and goals and tend to meaningfully approach their livelihood and leadership. Also, once again considering this from a cognitive perspective, “themes,” which are the highest level of knowledge structure in Schank and Abelson’s (1977) script-based theory and connected to the level of one’s purpose, are the critical elements that influence a person’s ability to comfortably adapt their scripts or allow certain scripts, plans, or goals to take precedence over others. Finally, it is unknown whether panel members’ purposes (or themes) are what enabled them to earn positions of leadership or if their sense of purpose evolved as a result of growth from their leadership responsibilities, but there are indications that somehow their purposes contribute to their ability to be an effective leader in complexity (by the simple example that they were nominated for this study).

Research Question 4: How do experienced leaders of complexity believe other leaders can learn (or be taught) characteristics or skills to become more effective in complex environments?

In Round Two, panel members were asked to describe a learning experience that had a significant impact on their growth as a leader. Ten categories emerged from the responses submitted (Appendix J). In the third round, panel members were then asked to consider all the “significant learning experience” categories and rate the importance of them based on

what they would hope or recommend—in an ideal world—future leaders have in order to grow their leadership capacity. Panel members reached consensus—both from the consistent group and the comprehensive group—on the following four “significant experiences”:

- To gain experience in roles with wide responsibility and/or extra assignments which involve adversity or crisis management
- To learn from another executive (not boss) by observing his or her proactive, positive, and constructive behaviors (examples include knowing people’s names at all levels and openly working through matters with senior customer staff)
- To learn and gain inspiration from bosses that provide mentoring, encourage deep and comprehensive knowledge of business, and/or ask lots of questions from many perspectives to broaden thinking
- To learn from advice received or a personal coach (early in career) that gave perspective on how to approach overall career outlook and/or personally assess leadership strengths

To give some contrast to these experiences, it is interesting to note that the panel did not reach consensus on experiences such as having a cross-cultural experience, teaching teams to personally gain more subject knowledge, having influences during youth years (family role models and/or leadership roles), and learning from structured executive events or personal study. It is worth noting that the four significant experiences that panel members agreed on take place, for the most part, “on the job” and have very little to do with structured activities or previous experiences. Certainly, “on the job” learning is expected to be highly rated, yet it is curious why panel members see the other experiences as less important. It is difficult to tell if this could be because panel members are more experienced in their careers and might not recall significant experiences in earlier development years and because panel members, at their senior level, are less likely to participate in structured activities.

Research Subquestion 4.1: When (at what age, career stage, etc.) do most highly effective leaders tend to develop their skills to manage complexity and when is the optimal time to teach such skills to prepare leaders for effective leading in complexity?

After many questions about what was important for a complexity leader’s learning, panel members were asked to rank the optimal time periods for leaders to develop or be taught skills to manage complexity. Two time periods were ranked as more important than the others: during “5-10 years of career/working experience” and during “the middle stages of career” (Appendix L). Fifty percent of the consistent group and 52% of the comprehensive

group ranked “5-10 years of career/working experience” as the most important (ranked 1 on a scale of 1-7). Thirty-nine percent of the consistent group and 36% of the comprehensive group ranked “middle stages of career” the next most important time period (ranked 2). Appendix L contains rank ordering percentages for each of the time periods and indicates there was not agreement on a precise ranking of importance. There were, however, 61% from the consistent group and 52% from the comprehensive group that ranked “later stages of career” as the least important (ranked 7).

The time periods which fell into the middle of the rankings include: critical points in their career journey (promotions, unexpected setbacks, etc.); first 5 years of career/working experience; college, university, or graduate studies; and youth or adolescent years. The researcher finds it intriguing that panel members would be split on the other time periods and would once again, as previously discussed with the significant learning experiences, believe experiences in their earlier development years were not as important. This is curious especially given the comments a few panel members made about adaptability and previous conditioning—needing to be trained from youth (parents are too protective) and the influence of communist rule. It could indicate that panel members “assume” leaders already have certain fundamental skills (when they are hired, for example) in order to learn additional complexity behaviors in the workplace. However, this finding could also reveal that panel members are less familiar with cognitive aspects and how knowledge structures impact a leader’s behaviors in complexity. Further study and exploration would be required to gain better understanding.

BACKGROUND INFORMATION ON EXPERT PANEL PARTICIPANTS

The background questionnaire contained 10 questions and was sent to the 26 expert panel participants who responded to the Round One questionnaire. All 26 returned the background questionnaire. Tables displaying specific percentages, averages, and numbers reported for each question item, as well as some corporate-reported demographic data, are displayed in Appendix N.

All panel members held the title of vice president or above (i.e., also includes group vice presidents, senior vice presidents, etc.) at Oracle. Executive leaders from 12 countries (and 20 different cities) were on this panel including: Argentina, Australia, Brazil, China,

Denmark, Germany, India, Singapore, Sweden, United Arab Emirates, United Kingdom, and the United States. Overall, there was an extensive amount of work experience, with panel members averaging 22.7 years (with an overall range from 32 years to 12.5 years) of total, cumulative work experience in the corporate world. Participants also averaged 10.1 years (with an overall range from 19 years to 1 year) of experience at Oracle, which is a meaningful amount of time given the relatively typical, short tenure of high technology employees at one company. Panel members had an average of 15.5 years (with an overall range from 26 years to 6 years) serving in a formal leadership position at any level of management at all places of employment. And, participants had an average of 2.6 years (with an overall range from 6 years to 6 months) in their “current” leadership position at Oracle, which might indicate the typical amount of change and reorganizing that happens with Oracle’s lines of business.

Twenty or 77% of the panel members were men and 6 or 23% of the participants were women. This corresponds to the corporate reported data of 81% and 19%, respectively, of the worldwide executive population in Oracle. The panel members were also representative of the various business units, distributed similarly to the actual percentage of employee population within each business unit. On average, the panel members were responsible for organizations with 573 employees, with an overall range from 2,600 employees to 25 employees.

The panel was also somewhat reflective of the percentages of employee population spread across the globe. The panel was comprised of the following: Asia Pacific region was 23%, Europe and Middle East region was 26.9%, Latin America region was 11.5%, and the North America region was 38.5%. Based on self-descriptions, the expert panel was also culturally and ethnically diverse. Of the 26 overall panel members, 23 agreed to have their identity associated with this study and 25 indicated a possible interest in future discussions related to the topics explored in this research.

SUMMARY

This chapter presents the key results of this Delphi study by research question. There was a strong indication that panel members are observing and experiencing elements of complexity theory in their organizations and a clear consensus that the key challenge

complexity leaders face is the attracting, retaining, and motivating of employees, especially top talent. Panel members also identified 7 essential learning elements and 11 essential communication elements for leaders of complex environments, in addition to 10 essential characteristics or skills for being an effective leader. Findings also include: the most ineffective leadership characteristics, assessments on behaviors “actually” observed as compared to behaviors that are “most effective” for leaders, framework of a shared worldview among panel members, and suggestions on significant learning experiences and optimal time periods to develop future leaders.

In Chapter 5, the study and key findings are summarized. Implications of these findings are discussed in relation to the theoretical frameworks for complexity theory and cognitive science. Limitations to the study are also presented, in addition to recommendations for practical application and future research.

CHAPTER 5

IMPLICATIONS, LIMITATIONS, AND RECOMMENDATIONS

INTRODUCTION

This exploratory study examined how leaders function in and observe an actual complex system, while discovering emerging elements and possible leadership guidelines, especially from a cognitive perspective, in the nascent field of complexity. The study was designed to understand the primary challenges leaders face and identify the possible characteristics, methods, and worldviews that enable leaders and complex systems to operate effectively.

This chapter commences with a summary of the study and its key findings. Implications of the findings are then discussed in reference to the theoretical models for complexity and cognition introduced in Chapter 2. Advantages of the Delphi method and limitations to this study are also discussed. The chapter concludes with recommendations for practice and future research.

SUMMARY OF THE STUDY

Many complex factors impact an organization's overall effectiveness and awareness. Yet, executive leaders are seen as having the ability to influence change, solve problems, and play a vital role in helping people to effectively navigate ambiguity and complexity. This study was designed to explore how executive leaders in a complex system at Oracle Corporation, the largest enterprise software company worldwide, observe their environment, describe emerging leadership elements, and employ cognitive skills as a means to advance the organization's overall effectiveness and broader awareness.

The Delphi method was determined the most appropriate technique to examine the study's research questions given the geographically dispersed subject pool, which involved leaders located in 12 countries and 20 different cities around the world. Also, the inherently

complicated concept of complexity theory had not been previously explored in many practical, complex corporate environments.

Based on a set of criteria, executives were nominated by Oracle's human resources senior leaders. Selection criteria included: a formal title of vice president or above, experience with significant organizational challenges, and diversity that appropriately represented the company's employee population. Twenty-six nominated executives from multiple Oracle business units gave their consent to participate in this forum; 18 of those executives completed all three rounds of the study (the consistent group) and 25 of them completed the first and third rounds of questions (the comprehensive group).

The Delphi process included three rounds of open-ended questions, combined with ratings and rankings of previous response items, and one background questionnaire to collect demographic information on the panel members. Questionnaires were distributed online to expert panel members and data were analyzed to identify and categorize emerging themes, so group consensus and further reflection upon ideas generated could be explored in subsequent rounds of questions.

Expert panel members were sent a copy of compiled panel results after each round of questioning. Anonymity of all group members was maintained throughout the study. The entire study took approximately 3 1/2 months to complete.

SUMMARY OF THE FINDINGS

A breadth of data was gathered in this exploratory study that might provide a foundation for future research and inform practice. There was a strong indication that panel members are observing and experiencing elements of complexity theory in their organizations and a clear consensus (ranked as the most important by the panel) that the key challenge complexity leaders face is the attracting, retaining, and motivating of employees, especially top talent. Panel members also reached consensus on seven other challenges:

- Collaborating and operating effectively across multiple lines of business and disciplines and thinking from other perspectives (customer, lines of business, or coworker perspectives) to enhance overall organizational effectiveness
- Developing or finding (cultivating) managers with strong leadership skills
- Providing clear direction and being able to effectively connect with virtual team members distributed across time zones

- Ability to process and filter extensive information to make appropriate decisions
- Cognitive agility to make the complex simple and navigate uncertainty
- Communicating and delivering value to customers and having a balanced focus between products and customers
- Managing and producing results with employees and virtual teams that do not directly report to you

Panel members also identified 7 essential learning elements and 11 essential communication elements for leaders of complex environments. The essential learning elements included:

- Actively learn from others by asking key questions, seeking multiple perspectives, or problem solving together
- Be open to new ideas and learning new things—view every problem as an opportunity
- Learn (in general) from each interaction with people (team members, boss, and/or peers)
- Learn (in general) from each experience, challenge, and the environment itself
- Actively learn by doing and from willingness to possibly making mistakes
- Be willing to be out of comfort zone when taking action and learn from mistakes
- Practice learning organization concept and regular leadership development initiatives with teams

The essential communication elements that the panel reached consensus on are as follows:

- Encourage dialogue, ask questions, and effectively listen to cultivate trust and involvement
- Focus on high clarity and consistent messages to give clear direction
- Personally deliver and actively seek honest feedback
- Be open and transparent (and somewhat informal approach)
- Have personal humility and view employees at every level as equal and valuable
- Realize importance of being reachable and maintaining relationships (internally and/or with clients)
- Give direct and straightforward comments
- Share as much information from above as possible to provide insight on goals and big picture
- Be conscious of having positive tone (even with negative matters), providing inspiration, and/or recognizing and thanking team members
- Deliver or want factual information

- Active team involvement and engage in participatory style

In addition, 10 essential characteristics or skills for being an effective leader in complexity were identified and the 7 most ineffective leadership characteristics were revealed. The most effective characteristics included:

- Ability to recognize and retain top talent and build strong team
- Ability to think big picture and motivate team toward common vision and goals
- Being an effective communicator and strong listener
- Ability to navigate complexity and ambiguity and lead change
- Ability to make bold decisions (especially based on facts/data)
- Building trust and credibility through integrity and humility
- Ability to balance competing priorities, focus, and get results
- Ability to manage and influence others, especially those outside your management responsibilities
- Being gracious, positive, energetic, and/or charismatic
- Being a quick and ongoing learner and problem solver

The most ineffective characteristics that reached consensus were:

- Poor communications skills, including ability to provide clarity and motivate
- Team does not see leader as trustworthy and credible; leader is unable to inspire and motivate others
- Lack of ability to produce results and satisfied with mediocrity
- Inability to adapt quickly and simplify complexity for their team; not knowing when to change and learn/work through the complexity
- Lack of respect for employees and their value; not understanding and developing employees and inability to recognize talent
- Operating in isolation and leader unwilling to cooperate and spread responsibility across the organization
- Arrogance and/or leading by intimidation; too focused on their “management role” and not doing what they ask others to do

Furthermore, panel members expressed their leadership philosophies and purpose and assessed the behaviors they “actually” observed as compared to behaviors that are “most effective” for leaders in complex environments. Based on Capra’s theoretical model, a large percentage (88.2%) of the panel chose the “most effective” behaviors to be either a combination of self-assertive and integrative or entirely integrative tendencies. The Delphi

panel also provided input on the adaptability of organizations and their worldviews and considered the possibilities and realities of implementing practices that support such worldviews among panel members.

The panel suggested many learning experiences or activities that would be beneficial for leaders and reached consensus on four “significant experiences” that they would hope or recommend—in an ideal world—future leaders have in order to grow their leadership capacity:

- To gain experience in roles with wide responsibility and/or extra assignments which involve adversity or crisis management
- To learn from another executive (not boss) by observing his or her proactive, positive, and constructive behaviors (examples include knowing people’s names at all levels and openly working through matters with senior customer staff)
- To learn and gain inspiration from bosses that provide mentoring, encourage deep and comprehensive knowledge of business, and/or ask lots of questions from many perspectives to broaden thinking
- To learn from advice received or a personal coach (early in career) that gave perspective on how to approach overall career outlook and/or personally assess leadership strengths

Finally, the two optimal time periods for future complexity leaders to be developed were identified as during “5-10 years of career/working experience” and during “the middle stages of career.”

While findings from this exploratory study suggest a foundation for the practical application of important complexity behaviors and elements, the study results also indicate there is a need for more in-depth research using additional research methods to investigate the findings of this Delphi study.

IMPLICATIONS OF THE FINDINGS

This study’s findings have both practical and theoretical implications. The overall results indicated that executive leaders were indeed experiencing elements of a complex system and observed or implicitly understood the difference between effective and ineffective behaviors. Yet, none of the panel members indicated a comprehensive strategy was being used to encourage or develop preferred complexity behaviors and skills in its leaders, although a few participants mentioned thoughtful programs or events that were being employed in isolated environments.

In general, a theme of the “need to be adaptive” was pervasive throughout the study. This included such elements as the willingness to learn, make mistakes, embrace ambiguity, and take risks. Interestingly, this seemed to be juxtaposed with another major theme that emerged about the increased sense of responsibility that panel members—as part of their leadership roles—felt for the development and motivation of their employees. The researcher was intrigued by this combination and was curious if and how it actually manifested itself in the work environment.

As foreshadowed in Chapter 4, the key findings generally supported the theoretical construct of a CAS and this model served as a reasonable metaphor for this international corporation. Also, most of the findings were consistent with the theoretical framework for complex learning and cognitive architectures as described in Chapter 2.

Practical Implementation of Theoretical Understanding

As previously described, executive leaders seemed to be aware of the complexity attributes they were experiencing in their environment and be cognizant, at least tacitly, of the behaviors necessary for producing optimal outcomes in complex systems. Yet, even if they subscribed to the theories and possibly shared a common worldview, the question becomes to what extent are they willing to actively implement practical changes or novel practices to enable more beneficial behaviors and skills to possibly be enacted? In the example where 93.5% of the consistent group and 90.5% of the comprehensive agreed with de Geus' (1997) concepts of an “economic company” and a “learning company,” it was somewhat disappointing—but not surprising—to see considerable skepticism that such new, creative learning metrics and measurements could or should be instituted along with traditional economic measurements.

Such examples indicate to the researcher that a phased or incremental approach to implementing or testing potential “learning” protocols, methods, and metrics for organizations would have the greatest chance for success, if such efforts were to be undertaken. Also, sponsorship from a few select leaders who seem to be keen on the possibilities of adopting new models would cultivate a group of internal champions and give initiatives the opportunity to be tweaked or enhanced from lessons learned in a limited, targeted rollout before being broadly implemented. And, of course, creative ways of

evaluating learning would need to be embraced. For example, a few panel members suggested the importance of recognizing risk taking and allowing space for experimentation (Appendix L) when creating a learning environment. One panel member explained:

Reward success and at least acknowledge the effort of those who tried and failed. People should not be afraid of failing and as a result not trying. This is a major problem, especially in sales. People decide not to engage because they say the deal is wired for the competition. They need to engage even if they know 100% they will fail and need to get rewarded if they give the competition a hard time, because we learn, and if we don't learn from the difficult deals, we will never win.

In general, based on the input from the study, it seems like executives are increasingly viewing the growth and development of their employees as an important aspect of their job, which has not typically been the mindset in most companies (and especially in high technology). The challenge remains that it is difficult—or impossible—to practically and meaningfully measure investment in such areas as learning and development, even though most conceptually identify it as a high priority. As Senge et al. (2004) explain, “The problem is the loss of balance between valuing what can be measured and what cannot, and becoming so dependent on quantitative measures that they displace judgment and learning” (p. 198). Given this, it might be helpful for all leaders to consider how and to what they assign value. For example, few would deny the importance and necessity of relationships (between humans, problems, or subject matters), but few could agree on ways to accurately assess the quality of such relationships. Yet, it does not mean that “relationships” between people or things will no longer exist just because they cannot be clearly measured.

Disconnect With the Aggregate Impact

As discussed, executive leaders seem to have an astute understanding of the dynamics and behaviors at work in their environments. And, let us assume they are willing and able to practically implement concepts as described in the aforementioned section. Do they also understand the cognitive aspects of “why” implementation of new learning initiatives is necessary? For example, do leaders recognize that employing a more comprehensive or explicit learning strategy could be one of the methods to addressing the key challenge of attracting, retaining, and motivating employees, especially top talent? It could help to stimulate and engage employees, as well as generate greater collective knowledge. Or, in another example, do executives understand the cognitive mechanics of “telling stories” (and

view it as more than just a creative technique) and realize why it helps employees better remember and apply information? Also, do panel members realize the similarities between the essential “learning” and “communication” elements they identified and would the creation of a more integrated, explicitly-stated strategy of these concepts be considered for their organizations?

Some could argue it is unnecessary to educate executives on the cognitive aspects as long as initiatives produce business results. However, as 1 panel member’s comments reflect what several others mentioned, “The issue I see most often is that we spend very little time, effort, or money on creating dialogue around the reason for change. We don’t allow employees to understand how the change will benefit them.” Hence, the researcher posits that if executives had deeper knowledge of cognitive elements and complexity theory, they would be more likely to see how their decisions and the critical aspect of “learning” directly impact the aggregate behavior of the system. Once again, it is worth reminding that the Santa Fe Institute’s “generally agreed upon principles” of CAS repeatedly suggest it is the “concerted behavior of the system’s agents (humans), the aggregate behavior, that we must understand.”

Modifying Behaviors at All Levels

This study focused specifically on executive leaders because of the leveraged impact and broad influence they can generally have on their organizations. The study also explored possibilities to develop other current and future leaders at multiple levels in the organization. However, it is also important to acknowledge that all team members at every level—individual contributors and managers alike—would need to collectively and individually adjust their expectations of leaders, even if the panel input is perfectly adopted. As 1 panel member explained, “I have found that team members expect that their leaders exert a certain amount of authority and self-assertive behaviors.” And, once again, as panel members noted the significance of conditioning—with the examples of youth experiences (protective parents) and communist influences, this type of behavior modification does not happen quickly. As described in Chapter 2, most of Western society has been influenced by a rationalist worldview; hence, most people have been significantly influenced by school systems, government, and businesses that reinforce such worldviews that have origins in behaviorism.

The researcher (who is also an employee) has regularly observed that employees may feel frustrated with the uncertainty or constant change that is prevalent in Oracle's environment. Yet, it could be posited that all employees need to understand and accept that ambiguity and regular, organic change is "okay" and in many ways "healthy" (given the definition of a CAS) and is actually more preferable than methodical and controlled approaches. Of course, the current reward systems and metrics—whether from society in general or the company itself—do not tend to encourage such outlooks, but revisions to such standard practices only tends to happen when a concerted group of individuals become aware and start to operate in a different way (which is once again explained in the definition of CAS).

ADVANTAGES OF THE DELPHI METHOD AND ONLINE QUESTIONNAIRES

The Delphi method seemed to have worked well for this study. Panel members' knowledge of complex systems and its associated cognitive aspects appeared to have been enhanced through participants' involvement in the study. Several panel members mentioned that they "learned" as a result of participating and were interested in a future forum or virtual community to discuss ideas and topics related to complexity and leadership. A few panel members expressed a desire to connect with fellow executives and 1 executive explained,

We used to have trusted peers, someone you could go to and discuss questions around work. Now we work with email addresses and approval chains, some of whom we have never met in real life. Where can I go to discuss challenges at work?

Given the extensive amount of written text that many participants provided, participants seemed to be engaged and interested, although busy schedules and holidays were variables.

The online questionnaires were convenient and efficient for very scheduled executives. The online survey tool also enabled the researcher to monitor submissions, send friendly reminder messages, and efficiently download data for analysis. The researcher was also able to send panel members comprehensive, compiled results of their feedback shortly after submission dates and easily communicate with panel members via electronic mail.

LIMITATIONS OF THE STUDY

Given the exploratory nature of this study, it was hoped that the findings would guide practice and suggest a foundation for further research on the application of complexity theory concepts in corporate environments. Yet, a few limitations to this research must also be acknowledged, some of which were previously discussed in Chapter 1. Other limitations became clear during the study and mostly concerned the assumptions and interpretations made by participants and the researcher, the validity and creation of the questionnaires, and the potential for bias during data analysis. Yet, the steps of sending data summaries to the panel after every round of questions and having an external reviewer examine every round of compiled feedback helped the researcher maintain a greater level of objectivity. Knowing that the data summaries were being sent to fellow employees (since the researcher is also an employee) inspired the researcher to be as neutral as possible when sharing results, so as not to be judgmental when sharing participant responses in relation to theoretical models.

Upon reflection, the researcher could have included a couple of additional items that reached consensus in the previous rounds; however, it had been deemed unnecessary at the time given the study's specific focus on the cognitive elements of complexity. Yet, despite these limitations, some valuable recommendations can be offered.

RECOMMENDATIONS FOR PRACTICE

The first and most obvious recommendation would be to create an online forum or virtual community of executives that employs a Delphi approach on an ongoing basis. As has been repeatedly mentioned, executive leaders do not get the opportunity to "hear" and learn from the perspectives of their peer executives on a regular basis. This particular format gives an "equal" voice to all ideas and does not allow one individual to dominate, as can sometimes be the case in face-to-face settings.

A second suggestion could include the design and development of a comprehensive learning strategy that encompasses the principles suggested by Arie de Geus' (1997) discussion of the "economic company" and the "learning company." Given the panel's overwhelming agreement with the concept but mixed reaction to the practical implementation of it, a collaborative design process could engage executives by asking for their initial input and then testing certain elements on a select basis. If done effectively, it

could become a truly “living” strategy that would be continually adjusted as it is “organically” implemented (i.e., those who seek it could implement elements of it and it would be allowed to naturally “catch on,” but it would not be a mandated program).

Thirdly, the results of this study could be analyzed with Oracle’s global 360 assessment competencies for executive leaders (and eventually with front and mid-level leader 360 assessments as well). Oracle recently redesigned this global, centralized assessment and has begun collecting data in the tool’s normative database so that leadership trends in every region can eventually be analyzed. It would be intriguing to compare the 360 competencies with the findings of this study and ensure there is synchronicity in the behaviors and skills being assessed.

A fourth suggestion could involve a deeper analysis to connect the panel’s recommended “learning experiences” with the optimal time periods for development. Correlating these items could provide a more thorough understanding of how future leaders (or students) could be more intentional about developing their skills and preparing themselves to effectively manage complexity. This could also complement the 360 assessments by providing development suggestions that are most appropriate for a specific leader’s 360 results.

A fifth recommendation could be the design and development of an educational program or series that would expose Oracle’s leaders to concepts of complexity theory and cognition. It could involve external experts such as Peter Senge or Physicist Fritjof Capra, who is a professor at the University of California, Berkley (which is located near Oracle’s corporate headquarters). This would give the models credibility and provide Oracle leaders with the opportunity to engage with experts in the field, which is often an important aspect to convincing this intense, Type A employee population of the value of new concepts and theories (especially when it comes to the human—nontechnical—realm). Other key design considerations of an educational series would include a focus on virtual learning techniques to continually engage a geographically dispersed population and “on the job” or informal learning activities (especially given the panel’s low ratings for structured learning).

Sixth, it would be fascinating to engage the expert panel in the selection of the top learning ideas they recommended in Round Three. Then, a protocol or standardized implementation approach could be created for each of the ideas chosen so any leader who

desired to implement a specific idea could easily replicate the approach. What would be somewhat “special” about this, rather than have it be another human resources-owned method, is that it would be “owned” or “endorsed” by the panel and they would be considered the authors of the ideas. Inevitably, this would increase the likelihood of adoption and increase awareness “organically.”

Finally, an idea that extends beyond the corporate environment could focus on the concept of inter-generational learning and mentoring to encourage younger leaders to embrace and practice behaviors that would be optimal in a complex environment. For example, college or graduate students could be partnered with business leaders and serve as “complexity apprentices.” The students could learn from business leaders in a work environment and be tasked with exploring predetermined (by the business leaders) complex problems or situations. The students could propose possible solutions to the business leaders and business leaders could provide input, allowing for a mutually beneficial exchange to occur all within the guidelines of what complexity theory suggests.

RECOMMENDATIONS FOR FUTURE RESEARCH

There are several opportunities for future research. First, the researcher believes it is important to further examine the significant learning experiences that influenced effective complexity leaders and the optimal development times for future leaders of complexity. As previously mentioned, it was curious and somewhat unexpected to find that panel members placed minimal importance on earlier development years (youth, college, or early career) when they were asked to rate or rank such items. In contrast, several written responses to open-ended questions commented on or alluded to the strong influence of previous conditioning and experience. Hence, conflicting input illuminates the need for further investigation. As the Delphi literature suggests, “There is often considerable value to decision makers in observing the nature of rejected assumptions” (Goldstein, 1975, p. 225).

Second, it would also be useful to do an in-depth study on the “themes” (based on the concept of script-based theory from Chapter 2) of executive leaders. A careful correlation of their self-defined “leadership philosophy” and “purpose for leading” could be done. This could also be examined from the perspective of Capra’s self-assertive and integrative model and the spiritual-based business model presented at the conclusion of Chapter 2. Given how

one's knowledge structure is dependent on themes, this could give meaningful insight into the common or distinct elements with which most complexity leaders cognitively function.

Thirdly, it might also be interesting to look at the data collected from gender, cultural, or business unit perspectives so see if any trends or themes emerge. Given the focus of this study, it was important to have a complex, eclectic view to see if consensus could be reached or common ideas emerged. Yet, an analysis of a subset of the data might give more insight into possible future research or application.

A fourth recommendation could be to do an in-depth case study of an executive's organization and/or a comparative case study of 2 or 3 executives and their respective organizations. Case studies would allow for more observation of the "actual" behaviors being used and could involve the use of multiple methods (e.g., interviews, surveys, document review, observation). This research would give deeper insight into effective and ineffective behaviors, tacit assumptions, and misconceptions about operating in a complex system.

A fifth suggestion could include a repeat of this exact Delphi study with a group of nonnominated executives (from the same environment) to compare how the findings might be similar or different. This might also begin to indicate if complexity leadership behaviors or characteristics tend to be more innate or developed (nurtured) and could lead to further in-depth exploration on this subject.

Finally, a broad-scale survey could be done with executive leaders from a variety of corporations to examine the awareness levels of complexity elements. This panel's suggested essential characteristics and behaviors could be evaluated and additional input would be requested on the learning activities organizations are employing. Then, if possible, a sample of individual executives could be selected for interviews and observations to compare reported practices with actual practices. This would help provide a more complete picture of complexity phenomena in the corporate environment.

FINAL WORDS

As our world grows increasingly complex at an intensified pace, leaders must become facile managers of ambiguity and have the ability to effectively lead complex systems. It is increasingly apparent that knowledge about complexity theory and its associated behaviors,

especially from a cognitive perspective, is essential to the peaceful and productive growth, evolution, and existence of our organizations and society in general.

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APPENDIX A

DELPHI PROCESS: SCHEDULE OF ACTIVITIES

Appendix A

Delphi Process: Schedule of Activities

Phase	Distribution dates	Submission dates	Instrument
Pre-test	December 3, 2006	December 12, 2006	Pilot questionnaire to test for face validity and wording.
Round 1	December 21, 2006	January 13, 2007	On-line questionnaire containing eight open-ended questions.
Round 2	February 9, 2007	February 20, 2007	On-line questionnaire with Likert scales and open-ended questions.
Background Survey	February 26, 2007	March 7, 2007	Closed item questionnaire with ten questions.
Round 3	February 26, 2007	March 7, 2007	On-line questionnaire with rank order items and open-ended questions.

APPENDIX B

EXPERT PANEL RECRUITMENT LETTER

Appendix B

Expert Panel Recruitment Letter

Dear HR Executive Leader,

I would like to ask for your nominations to invite Oracle executives to participate on a global expert panel for a dissertation study that explores emerging leadership elements important to being effective in a complex environment. Given your leadership role and your close relationships with LOB executives, you have a trusted and unique view into our diverse organization. [Our senior vice president] has kindly given her support for this study, and I am hopeful this research will provide beneficial insight for future organization development initiatives and that nominated executives will be honored by the HR executive team's recognition of their leadership abilities.

ABOUT THE STUDY

As our world grows increasingly complex at an intensified pace, leaders must be facile managers of ambiguity and have the ability to effectively lead complex systems. An international corporation such as Oracle is a microcosm of complexity and an ideal environment to explore how leaders can help organizations constructively navigate a dynamic, multi-cultural, unpredictable existence. As an Oracle employee and a doctoral student at the University of San Diego, I am focused on discovering how scientific concepts from complexity theory and cognitive science could help to enhance leaders' and organizations' overall effectiveness and awareness.

I am recruiting executive leaders from each of Oracle's respective regions – APAC, EMEA, LAD, and North America – to share their experiences, perspectives, and expert opinions on what is important to being an effective leader in complexity. Much has been written about complexity management and cognitive science from a theoretical perspective but the practical application and integrated study of such concepts is limited; Oracle provides a unique environment to gain a deeper understanding of the current reality of leadership. This, in itself, is not a study on Oracle as an organization or its policies, business strategy, or direction; rather, it is an exploration of the characteristics and possible common denominators that executive leaders working within the same complex environment tend to exhibit and/or identify as being important.

PARTICIPATION

The dissertation is titled, *Emerging Elements of Leadership in a Complex System: A Cognitivist Approach*. Expert panel participation involves a minimal time commitment; panelists will be asked to respond to a series of three short, web-based questionnaires distributed via email (approximately 20 minutes for each questionnaire) about every three weeks for a period of three months beginning in December 2006. After each questionnaire, participants will receive the compiled feedback of their comments and have an opportunity to reflect upon, learn from, and compare their comments with other panel experts as they wish. Panel participation promises to be stimulating and this type of indirect, peer-to-peer collaboration could prove fruitful for executive development.

Participation is anonymous in that specific comments will not be associated with an individual or line of business. The feedback will be analyzed and organized in categories with every effort to preserve anonymity among the participants. At the end of the study, however, experts will be given the option to allow their name to be associated with the overall study in a general way.

CRITERIA FOR NOMINATION

The expert panel will consist of 20-25 executives. The representative number of executive leaders should target the corresponding percentage of employees located in each region: North America, 43%; Asia Pacific, 28%; Europe & Middle East, 26%; Latin America, 3%. Certainly, it gets complex with LOBs that go across geographies; however, please do your best to nominate leaders that are representative of your respective regions.

Each region should nominate executives as follows:

North America	9 – 12 nominees
APAC	5 – 8 nominees
EMEA	5 – 7 nominees
LAD	1 – 3 nominees

Nominated panel members should also meet the following three criteria:

1. Leader currently holds the title of **vice president or above** with at least two years working in a formal authority position in a corporation. For purposes of this study, formal positions include: director, senior director, vice president, senior vice president, and executive vice president. Vice presidents who are recently promoted or new to Oracle are eligible as long as they served in one of the preceding positions.
2. Leader nominations should **consider ethnic and gender diversity that appropriately represents** the composite of the regions and respective business units. I will also review the final nominee list to ensure it appropriately reflects the regional and business unit populations from a demographic perspective.
3. Leader has **experienced significant challenges** within their organization in the last two years and has **exhibited expert performance** while leading their organizations through these complex challenges.
 - Recommended guidelines to consider when determining expert performance in complexity are suggested by Physicist Fritjof Capra. He explains the two human tendencies of 'self-assertive' and 'integrative' (in the following chart) as being essential aspects of living systems and that a healthy, dynamic balance of both is necessary.
 - Please consider executives that seem to demonstrate a healthy balance of the following tendencies from a thinking and values perspective.

Thinking		Values	
<i>Self-Assertive</i>	<i>Integrative</i>	<i>Self-Assertive</i>	<i>Integrative</i>
Rational	Intuitive	Expansion	Conservation
Analysis	Synthesis	Competition	Cooperation
Reductionist	Holistic	Quantity	Quality
Linear	Nonlinear	Domination	Partnership

(Capra, 1996, p.10)

Please submit your nominations to me (). **Please include the name, title, LOB, and location within region for every nominee.**

I sincerely thank you for your support of this valuable study. Also, you will have the opportunity to review the compiled questionnaire feedback and be updated on the research findings.

Please feel free to contact me by phone at 619.531.1650 or my committee chairperson at the University of San Diego, Dr. Johanna Hunsaker, at and/or 619.260.4858 with any questions or concerns about this study.

Best regards,
Kirsten Hanson

APPENDIX C

INFORMED CONSENT FORM

Appendix C

Informed Consent Form

Dear Executive,

My name is Kirsten Hanson and I am a doctoral student in the Educational Leadership program at the University of San Diego and San Diego State University. I am also an Oracle employee, currently serving in the Human Resources role of Sr. Director for Global Organization and Talent Development. I am conducting a research study to examine the emerging leadership elements important to being effective in a complex environment. The findings will be reported in my dissertation that I will complete as a requirement for graduation.

You are being asked to participate because you have been nominated by a panel of Human Resource executives at Oracle Corporation as a leader within Oracle Corporation who exhibits skillful performance in complexity. Please review the study description below. If you agree to participate, click on the link at the end of the page to give your consent to participate on this expert panel of leaders from Oracle Corporation. Thank you.

Purpose of this Study

The purpose of this study is to explore emerging leadership elements important to being effective in a complex environment. As our world grows increasingly complex at an intensified pace, leaders must be facile managers of ambiguity and have the ability to effectively lead complex systems. An international corporation such as Oracle is a microcosm of complexity and an ideal environment to explore how leaders can help organizations constructively navigate a dynamic, multi-cultural, unpredictable existence.

Research Methodology and Time Frame

This study will employ the Delphi technique. Delphi methodology involves the use of a panel of experts on the particular topic to be explored. The nature of the Delphi process allows for anonymous group communication between geographically dispersed panel participants. Literature on the Delphi process recommends that the researcher pose initial questions in the broadest terms on the first questionnaire to allow for rich responses from the participants. The researcher will then summarize panelist responses and feed these responses (in cumulative form) back to the panel in a second round questionnaire in which participants may be asked to rank priorities and add any additional ideas to the topic of discussion.

Panel participants will respond to three to four rounds of electronic, mini-questionnaires dispersed over a two to three-month period, depending on the timeliness of panel responses, until group consensus is reached. The first on-line mini-questionnaire will be sent in December 2006. It should take an average time of 20 minutes to complete the mini-questionnaires, however, panel members may choose to take more time in writing their responses.

Participation in this study involves completing all rounds of mini-questionnaires sent via electronic mail links, along with a final demographic form to provide basic background information near the end of the study.

Anonymity and Confidentiality

Participant anonymity will be enhanced in this study by using on-line links to questionnaires. By using electronic mailing lists, the researcher will be able to track which panel members submitted questionnaires throughout the Delphi process. However, the researcher will not be able to link actual questionnaire responses to individual participants. The researcher will summarize group responses and send this information to the panel members in a cumulative form.

Only the researcher will know the name and line of business of each panel participant. This information will not be made available to other participants in the study. After completion of the Delphi process, panelists will be given the option to affiliate their names and/or lines of business with this study in a general way if they choose.

Benefits and Risks

Benefits for participation in this study include the opportunity to share ideas on best practices with other peer executives in similar roles in Oracle throughout the world. Personal satisfaction may arise from contributing to the growing body of knowledge on effective leadership in complex systems. Also, panel participation promises to be stimulating, and this type of indirect, virtual collaboration could provide beneficial insight for future organizational development initiatives.

No major risks are anticipated in this study beyond those encountered in daily professional life. The researcher will make every effort to ensure that computer viruses are not received or transmitted through use of the on-line surveys or any other electronic correspondence related to this study.

Participant Questions

Expert panel participants may ask questions about this research at any time and the researcher will make every effort to clarify any aspects of the study at any time. The researcher, Kirsten Hanson, is a doctoral student and Oracle employee, currently serving in the Human Resources role of Sr. Director for Global Organization and Talent Development, and can be contacted in California, USA at 619.531.1650 or by email at kirsten.hanson@oracle.com. Her dissertation advisor, Dr. Johanna Hunsaker, may be contacted at the University of San Diego at 619.260.4858 or jhunsaker@ucsd.edu. You may also contact the Institutional Review Board at SDSU (619.594.6622; irb@ucsd.edu) or USD (619.260.4553) to report problems or concerns related to this study.

Voluntary Participation

Participation in this study is voluntary and the participant may withdraw from this project at anytime. If you agree to participate, please click on this link to submit your consent: [link]

Name:

Title:

Line of Business:

Office Location:

APPENDIX D

ROUND ONE: COVER LETTER

Appendix D

Round One: Cover Letter

Dear Expert Panel Participant,

Thank you for your participation on this global panel of Oracle executives. Your involvement in this study is highly valued; the meaningful insight from this panel is helpful for developing other strong leaders in these complex times.

Please click this link to complete the first questionnaire by Saturday, January 13, 2007:

[link]

HELPFUL TIPS

- For your convenience, the questionnaire also appears below. You may wish to ponder the questions before actually completing the questionnaire or save your answers on a Word document so you can simply copy and paste them into the web-based questionnaire.
- If you need to exit the web-based questionnaire before completing all the questions, you will be able to re-enter the questionnaire at a later time and will be taken to the point that you left off so you can complete the questions and submit.

VALUE OF THIS ITERATIVE QUESTIONING METHOD

This first questionnaire involves open-ended questions and allows for more creative input, so as not to limit the group's initial ideas. Future questionnaires will ask the expert panel members to rank priorities and ideas based on the synthesized and summarized input from the first round. This method allows for new concepts to emerge and be anonymously shared and explored with peers, increasing the likelihood of practical application in future initiatives.

Please feel free to contact me with questions at any time at

Regards and best wishes,
Kirsten Hanson
619.531.1650

APPENDIX E

ROUND ONE QUESTIONNAIRE

Appendix E

Round One Questionnaire

1. What do you perceive to be the **THREE** greatest challenges to effectively leading in today's work environment?
 - 1.
 - 2.
 - 3.
 Other major challenges?

2. Please describe a significant work challenge you or your organization has experienced within the last 2 years. Please consider the following in your answer:
 - What role or actions did you personally take to help reach an outcome?
 - How were you satisfied or dissatisfied with this problem solving process and outcome?
 - What did you think, feel, or learn from this particular experience?

3. How do you describe your leadership philosophy or approach? Please explain.

4. How do you describe your communication style (approach)? Please explain.

5. How do you describe your personal learning style (approach)? Please explain.

6. Based on your experiences and perspectives as an executive leader, please identify **TWO** key characteristics or skills that make a leader effective in today's work environment.
 - 1.
 - 2.
 Others to add?

7. What are the top **TWO** reasons some leaders are ineffective or have difficulty managing the current work environment?
 - 1.
 - 2.
 Others to add?

8. **OPTIONAL QUESTION** – In addition to what you've already shared, is there a brief story or critical incident you observed or personally experienced that helps to further explain the dynamics and intricacies of your work environment? (Please do not describe your exact job function.)

APPENDIX F

**COVER LETTER—ROUND ONE: COMPILED
RESULTS**

Appendix F

Cover Letter Round One: Compiled Results

Dear Expert Panel Participant,

It has been a true privilege to study your thorough input and thoughtful reflections from the First Round Questionnaire.

Attached you will find the summary of the compiled (anonymous) feedback. I hope you enjoy this chance to read what's on the mind of this select group of your peer executives from around the globe!

A few points about the attached summary data:

- **Categories and sub-categories emerged from your input.** As you may recall, the first questionnaire included open-ended questions to allow for creative input and not limit the group's initial ideas. Hence, major categories and sub-categories for each question emerged as your responses were analyzed (responses were not forced into pre-determined categories).
- **Multiple points written in a response were recorded in the appropriate multiple categories/sub-categories.** Twenty-six executives are involved in this study; however, you will see more than 26 responses recorded in some of the questions because many responses were very thorough. Each time a topic was mentioned, it was counted and recorded in the appropriate category to ensure topics/sub-categories were not lost. For example, one panel member could have written a response to question 4 (about Communication Style) and expressed 3 distinct points about their approach to communication. So, the 3 phrases/sentences in their response that made the distinct points were coded into the 3 appropriate sub-categories/categories.
- **Panel member words or phrasing generated the phrasing or labeling of the categories/sub-categories.** Every effort was made to keep the category and sub-category labeling consistent with the type of language panel members used to describe topics. It is difficult for categories to be completely mutually exclusive and some overlap of ideas may be evident. However, an external reviewer (not affiliated with Oracle) also reviewed the categories and sub-categories of the anonymous input to check that the feedback was accurately and clearly recorded.

The **Round 2 Questionnaire** will be sent to you in the next day or two. The next questions will focus on evaluating or ranking key themes and concepts that emerged from this round of your feedback.

Thank you very much for your valuable time and commitment. Together, we can discover what is most helpful for developing other strong leaders in these complex times.

Best regards,
Kirsten

APPENDIX G

ROUND ONE: COMPILED RESULTS

Appendix G

Round One: Compiled Results

Note: The tables below contain the categories and associated sub-categories for the breakdown of the responses reported. If a panel member wrote about multiple topics in their response to a question, it was recorded and counted in the appropriate multiple sub-categories/categories for the question. The number of panel members who mentioned a particular topic is noted under the (No.) in the right column. The percentage of panel members who gave a particular response within the specific category is also noted in the far right column.

Question 1 Results:

What do you perceive to be the **THREE greatest challenges to effectively leading in today's work environment?**

* Four main categories emerged from the responses submitted to this question. Sub-categories within each of the main 4 categories were determined based on the topics mentioned.

1. Global, virtual, or multi-cultural challenges	No.	% of this category
Providing clear direction and being able to effectively connect with virtual team members distributed across time zones	9	42.9%
Balancing between global and local decisions, perspectives, and practices	5	23.8%
Managing multi-cultural teams and across cultural boundaries and differences	5	23.8%
Lack of mature management or difficulty retaining top talent in certain regions	2	9.5%
TOTAL responses coded in this category	21	100.0%

2. Challenges related to human skills, attitudes, and cognitive capacities	No.	% of this category
Attracting, retaining, and motivating employees, especially Top Talent	9	33.3%
Cognitive agility to make the complex simple and navigate uncertainty	4	14.8%
Ability to process & filter extensive information to make appropriate decisions	4	14.8%
Developing or finding (cultivating) managers with strong leadership skills	4	14.8%
Being adaptive & having the ability to lead change	3	11.1%
Ability to set goals and stay focused in a complex and fast changing environment	3	11.1%
TOTAL responses coded in this category	27	100.0%

3. Challenges related to collaboration and teamwork	No.	% of this category
Thinking from other perspectives (customer, LOB, or co-worker perspectives) and collaborating and operating effectively across multiple Lines of Business & disciplines to enhance overall awareness and organizational effectiveness	10	58.8%
Managing & producing results with employees & virtual teams that do not directly report to you	5	29.4%
Creating team unity and belief in success of others and not just personal gain	2	11.8%
TOTAL responses coded in this category	17	100.0%

4. Challenges related to the business industry or company environment	No.	% of this category
Company growth and increasing complexity impact ability to determine priorities and maintain high performance	6	18.2%
Limited time and increased workloads	6	18.2%
Communicating and delivering value to customers & having a balanced focus between products and customers	6	18.2%
Different leadership philosophies or styles among senior management levels can impact ability to lead	4	12.1%
Clarifying and aligning to company direction	3	9.1%
Industry requirements, direction, or evolution can impact employee productivity or opportunities	3	9.1%
Constant change in the industry, company, and competition	3	9.1%
Work problems are complex and balancing short-term needs with long-term plans is difficult	2	6.1%
TOTAL responses coded in this category	33	100.0%

Note. n=26

Question 2 Results:

Please describe a significant work challenge you or your organization has experienced within the last 2 years. Please consider the following in your answer: What role or actions did you personally take to help reach an outcome? How were you satisfied or dissatisfied with this problem solving process and outcome? What did you think, feel, or learn from this particular experience?

Of the 26 significant work challenges described by the expert panel of Oracle executives...

22 challenges were thoroughly explained in a way that identifies characteristics of a Complex Adaptive System (CAS). It is possible and likely that the other work challenge examples provided may also contain CAS behaviors but just may not have been explicitly expressed in the written descriptions provided.

Many scientists viewed the 1980s and 1990s as a time of paradigm shift in science. The Santa Fe Institute, a research institution which has provided much of the leading thinking and writing on the science of complexity, published (1995) seven "generally agreed upon principles" that govern all CAS behavior.

The seven principles paraphrased with human terms are:

In a system where agents (humans) interact incessantly, it is the aggregate behavior – which is nonlinear – we should try to understand. The agents (humans) are numerous and diverse, operating in a complex web of interactions; and the patterns are not accidental because the system reorganizes itself if one agent (human) is removed. The system's aggregate behavior exhibits continual novelty, and the agents (humans) use their internal (mental) models or schemas to direct their behaviors.

To put it in practical terms, John Holland, computer scientist and engineer and a Santa Fe contributor, explains "many of our most troubling long-range problems – trade balances, sustainability, AIDS, genetic defects, mental health, computer viruses – center on certain systems of extraordinary complexity. Despite appearances, the systems that host such problems – economies, ecologies, immune systems, embryos, nervous systems, and computer networks – have enough significant characteristics in common to make it possible, even probable, that common general principles explain their dynamics" (Holland, 1995, p.45).

Each challenge was also categorized according to the four categories of challenges that emerged from the Question 1 feedback (preceding question in this document). While the challenges may fall into more than one category, a primary category was carefully determined for each challenge. The **26** work challenges distributed into the appropriate categories resulted as follows:

- **6** - Global, virtual, and multi-cultural working challenges
- **6** - Challenges related to human skills, attitudes, and cognitive capacities
- **9** - Challenges related to collaboration and teamwork
- **5** - Challenges related to the business industry or company environment

The work challenges you thoroughly wrote about are insightful and interesting, however, they are not being shared here because of the promise to preserve anonymity. In a future question, we will explore how to better develop leaders to handle such complex challenges.

Question 3 Results:

How do you describe your leadership philosophy or approach? Please explain.

Background Information:

Each leadership philosophy submitted was carefully reviewed from the perspective of what scientists are describing as the difference between rational and complexity views.

Specific to people, physicist Fritjof Capra (1996) considers macro level social issues and suggests why such situations or conditions may exist by connecting it to human behaviors or tendencies. Capra further explains that our human understanding requires an expansion not only of our perceptions and ways of thinking but also our values, and there is a striking connection between thinking and values. Capra suggests two human tendencies or behaviors: one tendency being labeled as 'self-assertive' and the other tendency labeled as 'integrative.' Capra notes that neither the 'self-assertive' or 'integrative' tendencies are intrinsically good or bad. Both approaches are necessary and a balance is optimal. The following chart summarizes how Capra defines the human tendencies.

Thinking		Values	
<i>Self-Assertive</i>	<i>Integrative</i>	<i>Self-Assertive</i>	<i>Integrative</i>
Rational	Intuitive	Expansion	Conservation
Analysis	Synthesis	Competition	Cooperation
Reductionist	Holistic	Quantity	Quality
Linear	Nonlinear	Domination	Partnership

Note: It is possible and likely that the leadership philosophies submitted may contain more 'self-assertive' or 'integrative' tendencies, yet for the purposes of this study, only what was explicitly written was considered so as not to make incorrect inferences. Hopefully, the meaningful examples below will help the expert panel develop a shared understanding and perspective on how certain models could be helpful or unhelpful in the real world of leadership.

Of the 26 leadership philosophies described by the expert panel of Oracle executives...
8 philosophies seemed to be written about slightly more self-assertive behaviors
<p>Example philosophies include:</p> <ul style="list-style-type: none"> • "My leadership approach is results and excellence-oriented. I value fairness, focus, and being positive across my organization. I expect this of myself, and of all who work with me. I tend to be motivating as a person, and am usually able to engage my team to offer their best efforts, while keeping things simple in the process so we all maintain a healthy work-life balance." • "I lead by example. I have held virtually every [functional] job that you can have at Oracle from an [individual contributor role] to an [executive]. I know what it takes to be successful and I do it every day. I set the vision, hire the best possible talent and let them run their businesses. I listen, I support, I delegate responsibility and I inspect what I expect. I treat others fairly and uphold the highest standards of character and integrity."

- "My philosophy is to manage more downward than upward - and be knowledgeable about who is doing what on a regular basis. I believe the most important thing a manager can do is to hire and retain the best people - especially a direct staff and work hard to make sure they are happy and motivated."

12 philosophies seemed to be written about a combination of self-assertive & integrative behaviors

Example philosophies include:

- "Generally, I like to think that I lead by coaching - offering advice and encouragement to my team, allowing the managers/leaders on my team to make decisions as appropriate and offering my advice when I feel it's needed or when it's solicited. A critical aspect of leadership is decision-making. I offer these thoughts on how I prefer to approach decisions: - make decisions based on facts & critical analysis - invite opinions & dissenting views during decision-making process - stand behind decisions when final decision is made but stand prepared to reverse decisions if the results ultimately don't support the initial direction."
- "I feel I am a steward of the organization. My role is to help the people in the organization be successful so that the organization will be successful. My role is to articulate a clear vision, one that can be shared by each member of the org. Once aligned the org requires enabling tools, process, management, and recognition...it is my responsibility to ensure my leaders understand this role and can be successful fulfilling their responsibilities."
- "Surround yourself with the best people. You don't know everything. You cant. - Listen to them and your customers with an open mind - Make the hard decisions, set the vision and fully support the team in execution."

6 philosophies seemed to be written about slightly more integrative behaviors

Example philosophies include:

- "I see leadership as serving...we exist to support the people that work the actual process. Everything we do should be aimed at making these people more successful, empowered, etc. I connect with people and spend a lot of time building trust. I only exist because we need a leader for a team - not the reverse. That said, the leader needs to assume responsibility for strategy, direction, making required changes etc but should be done in a way that the team feels/is very much part of this."
- "I lead by example; motivate teams to work together. In today's complex work environment, teamwork is critical for success. Engagement requires effective communications and team motivation (team involvement instead of being told what to do). We also need to lead the way by taking ownership, working through the ambiguity, demonstrating our willingness to be part of the team."
- "Firstly, make sure you are enjoying your job and look forward to coming to work everyday. If that is not the case you will have a very hard-time motivating others. Second, make sure you lead by example. If you are not ready to do what you are asking others it would be difficult for other to follow you. Finally, be inclusive. If you want to surround yourself with people smarter than you then you need to make sure you are not overbearing. Make sure you let people be as effective as possible without letting your ego get in the way. Getting out of the way sometimes means letting someone make a mistake instead of trying to make sure you are always there to prevent it."

Question 4 Results:**How do you describe your communication style (approach)? Please explain.**

* Three main categories emerged from the responses submitted to this question. Sub-categories within each of the main 3 categories were determined based on the topics mentioned. Note. n=26

1. Methods of Formal Communications	No.	% of this category
Regular meetings or calls including management meetings, all hands meetings, and one-on-ones	8	72.7%
Written communications through newsletters & employee surveys	3	27.3%
TOTAL	11	100.0%

2. Methods of Informal Communications	No.	% of this category
Using informal communication tools (such as Instant Messenger) & general networking	4	100.0%
TOTAL	4	100.0%

3. Worldviews about Communication – Elements of Communication styles and approaches	No.	% of this category
Open and transparent (and somewhat informal) approach	13	16.9%
Give direct and straightforward comments	10	13.0%
Personally deliver and actively seek honest feedback	10	13.0%
Encourage dialogue, ask questions, and effectively listen to cultivate trust and involvement	9	11.7%
Conscious of having positive tone (even with negative matters), providing inspiration, and/or recognizing and thanking team members	8	10.4%
Realize importance of being reachable & maintaining relationships (internally and/or with clients)	6	7.8%
Active team involvement & engage in participatory style	5	6.5%
Share as much information from above as possible to provide insight on goals and big picture	5	6.5%
Personal humility & view employees at every level as equal and valuable	4	5.2%
Focus on high clarity and consistent messages to give clear direction	3	3.9%
Deliver or want factual information	3	3.9%
Sense of humor	1	1.3%
Total	77	100.0%

Question 5 Results:

How do you describe your personal learning style (approach)? Please explain.

* Three main categories emerged from the responses submitted to this question. Sub-categories within each of the main 3 categories were determined based on the topics mentioned.

1. Formal Learning through structured or planned activities and tasks	No.	% of this category
Read books, articles, case studies, etc.	10	58.8%
Attend management development programs, product meetings, or training sessions	4	23.5%
Play with technology and/or stay updated on current technical developments	2	11.8%
Give keynote speeches to external audiences	1	5.9%
TOTAL	17	100.0%

2. Informal Learning through actions, people, reflections, and the environment itself	No.	% of this category
Actively learn from others by asking key questions, seeking multiple perspectives, or problem solving together	6	20.0%
Learn (in general) from each interaction with people (team members, boss, and/or peers)	6	20.0%
Learn (in general) from each experience, challenge, and the environment itself	5	16.7%
Actively learn by doing and from willingness to possibly making mistakes	5	16.7%
Keenly aware of observing others (in work and/or in society) and characteristics they demonstrate	4	13.3%
Actively reflect on history and past experiences	2	6.7%
Use methods/tools/techniques such as with a Personal Coach or 360 Assessment which create space for active reflection and focus on future steps	2	6.7%
TOTAL	30	100.0%

3. Worldview or Mindset about Learning	No.	% of this category
Open to new ideas and learning new things - view every problem as an opportunity	5	26.3%
Willingness to be out of comfort zone when taking action and learn from mistakes	3	15.8%
Regular focus on Personal Development Plans or Personal Skill Improvement	3	15.8%
Humility, acknowledge there is much to learn from others, and the ability to live with uncertainty of not knowing all	3	15.8%
Believe in rapid learning pace and/or fast learning curve for self	3	15.8%
Practice Learning Organization concept and regular leadership development initiatives with teams	2	10.5%
TOTAL	19	100.0%

Note. n=26

Question 6 Results:

Based on your experiences and perspectives as an executive leader, please identify TWO key characteristics or skills that make a leader EFFECTIVE in today's work environment.

Effective leader characteristics or skills	No.	% of total responses
Effective communicator and strong listener	11	15.3%
Ability to recognize and retain top talent and build strong team	11	15.3%
Ability to navigate complexity and ambiguity and lead change	8	11.1%
Ability to think big picture and motivate team toward common vision and goals	7	9.7%
Ability to manage and influence others, especially those outside your management responsibilities	5	6.9%
Ability to balance competing priorities, focus, and get results	5	6.9%
Building trust and credibility through integrity and humility	5	6.9%
Ability to make bold decisions (especially based on facts/data)	4	5.6%
Being a quick and ongoing learner and problem solver	4	5.6%
Being gracious, positive, energetic, and/or charismatic	4	5.6%
Discipline, drive, and mental toughness	3	4.2%
Ability to effectively execute and win	3	4.2%
How perceived by others and a good understanding of internal politics	2	2.8%
TOTAL	72	100.0%

Note. n=26

Question 7 Results:

What are the top TWO reasons some leaders are INEFFECTIVE or have difficulty managing the current work environment?

Ineffective leader characteristics or reasons	No.	% of total responses
Unable to adapt quickly and simplify complexity for their team; not knowing when to change and learn/work through the complexity	11	18.0%
Poor communications skills, including ability to provide clarity and motivate	11	18.0%
Arrogance and/or leading by intimidation; too focused on their 'management role' and not doing what they ask others to do	7	11.5%
Lack of respect for employees and their value; not understanding and developing employees and inability to recognize talent	6	9.8%
Focused too narrowly or on the wrong priorities	5	8.2%
Unable to see bigger picture and focus on clear goals	5	8.2%
Operating in isolation and leader unwilling to cooperate and spread responsibility across the organization	4	6.6%
Team does not see leader as trustworthy and credible; leader is unable to inspire and motivate others	3	4.9%
Lacks self reflection on their own personal development and their purpose for leading	3	4.9%
Lack of ability to produce results and satisfied with mediocrity	3	4.9%
Lack business details and/or organizational skills	2	3.3%
Not given sufficient autonomy from environment	1	1.6%
TOTAL	61	100.0%

Note. n=26

APPENDIX H

ROUND TWO: COVER LETTER

Appendix H

Round Two: Cover Letter

Dear Expert Panel Participant,

As promised, here is the link to the Round Two Questionnaire.

Please complete this questionnaire by Wednesday, February 21:

[link]

HELPFUL TIPS

* Most of the questions involve rating scales (ratings 1-5) and it would be helpful if you could try to carefully differentiate the importance of each item as much as possible (for example – not rate everything as a 5). These items will be used to determine the most important elements of leading through complexity.

* You may find it helpful to have the Round One Summarized Feedback document, in case you want to refer to it.

* If you need to exit the web-based questionnaire before completing all the questions, you will be able to re-enter the web-based questionnaire at a later time and will be taken to the point that you left off so you can complete the questions and submit.

Thank you for your valuable time and enthusiastic participation. I look forward to your responses as the group begins to move toward panel consensus on the ideas explored about leadership in complexity.

Please feel free to contact me with questions at any time at

Best regards,
Kirsten Hanson
619.531.1650

APPENDIX I

ROUND TWO QUESTIONNAIRE

Appendix I

Round Two Questionnaire

Instructions: There are two purposes for this questionnaire: (1) to begin to narrow panel consensus regarding essential aspects of leading in complex environments and (2) to begin to identify potential success indicators and/or barriers to effective leadership that may be used to inform practice.

Most of the questions involve rating scales and it would be helpful if you could try to carefully determine or differentiate the importance of each item as much as possible (for example – not rate everything as a 5). These items will be used to determine the most important elements of leading through complexity.

1. In reference to Q#1 on the Round One questionnaire, at least four panel members named the following challenges as having the greatest impact on the ability to effectively lead in today's work environment.

On a scale of 1 (not at all important) to 5 (very important), please rate how important it is for leaders to be adept or proficient with the following challenges if they are to be effective.

Collaborating and operating effectively across multiple Lines of Business & disciplines and thinking from other perspectives (customer, LOBs, or co-worker perspectives) to enhance overall awareness and organizational effectiveness	1 2 3 4 5
Providing clear direction and being able to effectively connect with virtual team members distributed across time zones	1 2 3 4 5
Attracting, retaining, and motivating employees, especially Top Talent	1 2 3 4 5
Company growth and increasing complexity impact ability to determine priorities and maintain high performance	1 2 3 4 5
Limited time and increased workloads	1 2 3 4 5
Communicating and delivering value to customers & having a balanced focus between products and customers	1 2 3 4 5
Balancing between global and local decisions, perspectives, and practices	1 2 3 4 5
Managing multi-cultural teams and across cultural boundaries and differences	1 2 3 4 5
Managing & producing results with employees & virtual teams that do not directly report to you	1 2 3 4 5
Cognitive agility to make the complex simple and navigate uncertainty	1 2 3 4 5
Ability to process & filter extensive information to make appropriate decisions	1 2 3 4 5
Developing or finding (cultivating) managers with strong leadership skills	1 2 3 4 5
Different leadership philosophies or styles among senior management levels can impact ability to lead	1 2 3 4 5

2. In reference to Q#6 (on the Round One questionnaire) about key characteristics or skills that make a leader EFFECTIVE, four or more panel members provided the following ideas.

Keeping in mind the challenges you rated as most important in the previous question, please rate on a scale of 1 (not at all essential) to 5 (very essential) how essential the following characteristics or skills are to being an effective leader in today's work environment.

Being an effective communicator and strong listener	1 2 3 4 5
Ability to recognize and retain top talent and build strong team	1 2 3 4 5
Ability to navigate complexity and ambiguity and lead change	1 2 3 4 5
Ability to think big picture and motivate team toward common vision and goals	1 2 3 4 5
Ability to manage and influence others, especially those outside your management responsibilities	1 2 3 4 5
Ability to balance competing priorities, focus, and get results	1 2 3 4 5
Building trust and credibility through integrity and humility	1 2 3 4 5
Ability to make bold decisions (especially based on facts/data)	1 2 3 4 5
Being a quick and ongoing learner and problem solver	1 2 3 4 5
Being gracious, positive, energetic, and/or charismatic	1 2 3 4 5

3. In reference to Q#7 (on the Round One questionnaire) about reasons leaders are INEFFECTIVE or have difficulty managing the current work environment, three or more panel members provided the following thoughts.

Please rate on a scale of 1 (not at all difficult) to 5 (very difficult) what ineffective characteristics or skills are most difficult for leaders to overcome.

Inability to adapt quickly and simplify complexity for their team; not knowing when to change and learn/work through the complexity	1 2 3 4 5
Poor communications skills, including ability to provide clarity and motivate	1 2 3 4 5
Arrogance and/or leading by intimidation; too focused on their 'management role' and not doing what they ask others to do	1 2 3 4 5
Lack of respect for employees and their value; not understanding and developing employees and inability to recognize talent	1 2 3 4 5
Focused too narrowly or on the wrong priorities	1 2 3 4 5
Inability to see bigger picture and focus on clear goals	1 2 3 4 5
Operating in isolation and leader unwilling to cooperate and spread responsibility across the organization	1 2 3 4 5
Team does not see leader as trustworthy and credible; leader is unable to inspire and motivate others	1 2 3 4 5
Lacks self reflection on their own personal development and their purpose for leading	1 2 3 4 5
Lack of ability to produce results and satisfied with mediocrity	1 2 3 4 5

4. In reference to Q#5 (in the Round One questionnaire) about personal learning styles, seventy-four percent of the comments were about informal learning or mindsets/worldviews about learning rather than comments about formal learning methods or approaches. And, current research on extraordinary management in complex systems emphasizes that learning has become critically important.

Please rate on a scale of 1 (not at all essential) to 5 (very essential) how essential these settings, activities, or approaches are to your personal learning and the learning of your organization.

Read books, articles, case studies, etc.	1 2 3 4 5
Actively learn from others by asking key questions, seeking multiple perspectives, or problem solving together	1 2 3 4 5
Learn (in general) from each interaction with people (team members, boss, and/or peers)	1 2 3 4 5
Learn (in general) from each experience, challenge, and the environment itself	1 2 3 4 5
Actively learn by doing and from willingness to possibly making mistakes	1 2 3 4 5
Be open to new ideas and learning new things - view every problem as an opportunity	1 2 3 4 5
Keenly aware of observing others (in work and/or in society) and characteristics they demonstrate	1 2 3 4 5
Attend management development programs, product meetings, or training sessions	1 2 3 4 5
Willingness to be out of comfort zone when taking action and learn from mistakes	1 2 3 4 5
Regular focus on Personal Development Plans or Personal Skill Improvement	1 2 3 4 5
Have humility, acknowledge there is much to learn from others, and the ability to live with uncertainty of not knowing all	1 2 3 4 5
Believe in rapid learning pace and/or fast learning curve for self	1 2 3 4 5
Practice Learning Organization concept and regular leadership development initiatives with teams	1 2 3 4 5
Actively reflect on history and past experiences	1 2 3 4 5
Use methods/tools/techniques such as with a Personal Coach or 360 Assessment which create space for active reflection and focus on future steps	1 2 3 4 5
Play with technology and/or stay updated on current technical developments	1 2 3 4 5

5. Now that you've considered essential learning activities or approaches, can you please recall and describe a learning experience that had a significant impact on your growth as a leader? Please briefly explain what you learned and at what life phase or career stage it occurred.
6. In reference to Q#4 (in the Round One questionnaire) about communication, eighty-four percent of the comments were about worldviews of communicating and elements of communication styles and approaches rather than formal or informal methods of communicating.

Please rate on a scale of 1 (not at all essential) to 5 (very essential) how essential these views or elements of communication are to you and your organization being effective.

Open and transparent (and somewhat informal) approach	1 2 3 4 5
Give direct and straightforward comments	1 2 3 4 5
Personally deliver and actively seek honest feedback	1 2 3 4 5
Encourage dialogue, ask questions, and effectively listen to cultivate trust and involvement	1 2 3 4 5
Conscious of having positive tone (even with negative matters), providing inspiration, and/or recognizing and thanking team members	1 2 3 4 5
Realize importance of being reachable & maintaining relationships (internally and/or with clients)	1 2 3 4 5
Active team involvement & engage in participatory style	1 2 3 4 5
Share as much information from above as possible to provide insight on goals and big picture	1 2 3 4 5
Personal humility & view employees at every level as equal and valuable	1 2 3 4 5
Focus on high clarity and consistent messages to give clear direction	1 2 3 4 5
Deliver or want factual information	1 2 3 4 5

7. Now that you've considered essential communication elements, please consider the technique of 'Telling A Story or Scenario' which some famous leaders have been known to use to communicate messages. Do you believe the use of 'stories' helps to increase understanding when explaining or exchanging information with others in your organization and how often (if at all) would you say 'stories' are used in your organization? Please briefly explain.
8. As you may recall from the Round One Summarized Feedback document (pg. 4), physicist Fritjof Capra (1996) considers macro level social issues and suggests why such situations or conditions may exist by connecting it to human behaviors or

tendencies. Capra further explains that our human understanding requires an expansion not only of our perceptions and ways of thinking but also our values, and there is a striking connection between thinking and values. Capra suggests two human tendencies or behaviors: one tendency being labeled as 'self-assertive' and the other tendency labeled as 'integrative.' Capra notes that neither the 'self-assertive' or 'integrative' tendencies are intrinsically good or bad. Both approaches are necessary and a balance is optimal. The following chart summarizes how Capra defines the human tendencies.

Thinking		Values	
<i>Self-Assertive</i>	<i>Integrative</i>	<i>Self-Assertive</i>	<i>Integrative</i>
Rational	Intuitive	Expansion	Conservation
Analysis	Synthesis	Competition	Cooperation
Reductionist	Holistic	Quantity	Quality
Linear	Nonlinear	Domination	Partnership

(Capra, 1996, p.10)

- In your opinion, which behaviors do most leaders you currently observe tend to actually practice?

CHOOSE ONE ONLY

- Self-assertive behaviors
- Integrative behaviors
- Combination of Self-assertive and Integrative behaviors

- In your opinion – regardless of Capra's proposed model stated above, which behaviors do you believe tend to be most effective in complex environments?

CHOOSE ONE ONLY

- Self-assertive behaviors
- Integrative behaviors
- Combination of Self-assertive and Integrative behaviors

- Please briefly explain why you responded the way you did to the 2 preceding questions.

9. Please briefly discuss why you agree or disagree with the concept below and how it does or does not apply to your leadership philosophy or your work challenges.

"The fundamental insight of twentieth-century physics has yet to penetrate the social world: relationships are more fundamental than things" (Senge et al., 2004, p.199). Physicist Fritjof Capra (2002) explains, "At all levels of life, from the metabolic networks inside cells to the food webs of ecosystems and the networks of communications in human societies, the components of living systems are inter-

linked in network fashion.” Linking further to social systems, Capra (1996) continues, “The more we study the major problems of our time, the more we come to realize that they cannot be understood in isolation. They are systemic problems, which means that they are interconnected and interdependent... not only do our leaders fail to see how different problems are interrelated; they also refuse to recognize how their so-called solutions affect future generations”(p.4).

10. **OPTIONAL QUESTION** – Given the Round One Summarized Feedback and this second round of questions, are you particularly interested in a certain topic or question? Is there something you have discovered, reflected upon, or would like to explore further with this executive community?

APPENDIX J

ROUND TWO: COMPILED RESULTS

Appendix J

Round Two: Compiled Results

Question 1 Results:

On a scale of 1 (not at all important) to 5 (very important), please rate how important it is for leaders to be adept or proficient with the following challenges if they are to be effective.

Most important challenges for leaders to be adept at handling	1	2	3	4	5	Average
Attracting, retaining, and motivating employees, especially Top Talent	0%	0%	6%	22%	72%	4.67
Collaborating and operating effectively across multiple Lines of Business & disciplines and thinking from other perspectives (customer, LOBs, or co-worker perspectives) to enhance overall organizational effectiveness	0%	0%	0%	44%	56%	4.56
Developing or finding (cultivating) managers with strong leadership skills	0%	0%	11%	22%	67%	4.56
Providing clear direction and being able to effectively connect with virtual team members distributed across time zones	0%	6%	17%	33%	44%	4.17
Ability to process & filter extensive information to make appropriate decisions	0%	6%	11%	56%	28%	4.06
Cognitive agility to make the complex simple and navigate uncertainty	0%	0%	33%	33%	33%	4.00
Communicating and delivering value to customers & having a balanced focus between products and customers	0%	11%	17%	44%	28%	3.89
Managing & producing results with employees & virtual teams that do not directly report to you	0%	22%	6%	56%	17%	3.67
Managing multi-cultural teams and across cultural boundaries and differences	6%	0%	44%	33%	17%	3.56
Balancing between global and local decisions, perspectives, and practices	0%	17%	39%	28%	17%	3.44
Limited time and increased workloads	6%	22%	22%	33%	17%	3.33
Company growth and increasing complexity impact ability to determine priorities and maintain high performance	0%	39%	22%	33%	6%	3.06

Different leadership philosophies or styles among senior management levels can impact ability to lead	6%	28%	33%	28%	6%	3.00
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Note. n=18

Question 2 Results:

Please rate on a scale of 1 (not at all essential) to 5 (very essential) how essential the following characteristics or skills are to being an EFFECTIVE leader in today's work environment. Note. n=18

Characteristics or Skills that are most essential to being an effective leader	1	2	3	4	5	Average
Ability to recognize and retain top talent and build strong team	0%	0%	0%	33%	67%	4.67
Ability to think big picture and motivate team toward common vision and goals	0%	0%	0%	33%	67%	4.67
Being an effective communicator and strong listener	0%	0%	11%	22%	67%	4.56
Ability to navigate complexity and ambiguity and lead change	0%	0%	6%	67%	28%	4.22
Ability to make bold decisions (especially based on facts/data)	0%	6%	0%	61%	33%	4.22
Building trust and credibility through integrity and humility	0%	0%	11%	61%	28%	4.17
Ability to balance competing priorities, focus, and get results	0%	0%	28%	33%	39%	4.11
Ability to manage and influence others, especially those outside your management responsibilities	0%	6%	11%	61%	22%	4.00
Being gracious, positive, energetic, and/or charismatic	0%	6%	28%	33%	33%	3.94
Being a quick and ongoing learner and problem solver	0%	0%	39%	39%	22%	3.83

Question 3 Results:

Please rate on a scale of 1 (not at all difficult) to 5 (very difficult) what INEFFECTIVE characteristics or skills are most difficult for leaders to overcome.

Ineffective Characteristics or Skills most difficult for leaders to overcome	1	2	3	4	5	Average
Poor communications skills, including ability to provide clarity and motivate	0%	0%	11%	33%	56%	4.44
Team does not see leader as trustworthy and credible; leader is unable to inspire and motivate others	0%	6%	11%	33%	50%	4.28
Lack of ability to produce results and satisfied with mediocrity	0%	0%	28%	44%	28%	4.00
Inability to adapt quickly and simplify complexity for their team; not knowing when to change and learn/work through the complexity	0%	0%	39%	33%	28%	3.89
Lack of respect for employees and their value; not understanding and developing employees and inability to recognize talent	6%	11%	17%	50%	17%	3.61
Operating in isolation and leader unwilling to cooperate and spread responsibility across the organization	0%	11%	28%	50%	11%	3.61
Lacks self reflection on their own personal development and their purpose for leading	6%	11%	28%	33%	22%	3.56
Arrogance and/or leading by intimidation; too focused on their 'management role' and not doing what they ask others to do	0%	22%	11%	61%	6%	3.50
Inability to see bigger picture and focus on clear goals	0%	17%	28%	50%	6%	3.44
Focused too narrowly or on the wrong priorities	6%	33%	56%	6%	0%	2.61

Note. n=18

Question 4 Results:

Please rate on a scale of 1 (not at all essential) to 5 (very essential) how essential these settings, activities, or approaches are to your personal learning and the learning of your organization. Note. n=18

Essential Learning settings, activities, or approaches for self and organization	1	2	3	4	5	Average
Actively learn from others by asking key questions, seeking multiple perspectives, or problem solving together	0%	0%	6%	50%	44%	4.39
Be open to new ideas and learning new things - view every problem as an opportunity	0%	0%	6%	67%	28%	4.22
Learn (in general) from each interaction with people (team members, boss, and/or peers)	0%	0%	33%	28%	39%	4.06
Learn (in general) from each experience, challenge, and the environment itself	0%	0%	22%	50%	28%	4.06
Actively learn by doing and from willingness to possibly making mistakes	0%	11%	11%	44%	33%	4.00
Willingness to be out of comfort zone when taking action and learn from mistakes	0%	6%	28%	33%	33%	3.94
Practice Learning Organization concept and regular leadership development initiatives with teams	6%	6%	28%	28%	33%	3.78
Keenly aware of observing others (in work and/or in society) and characteristics they demonstrate	0%	6%	39%	33%	22%	3.72
Have humility, acknowledge there is much to learn from others, and the ability to live with uncertainty of not knowing all	0%	11%	33%	28%	28%	3.72
Regular focus on Personal Development Plans or Personal Skill Improvement	6%	0%	44%	50%	0%	3.39
Use methods/tools/techniques such as with a Personal Coach or 360 Assessment which create space for active reflection and focus on future steps	6%	11%	44%	22%	17%	3.33
Actively reflect on history and past experiences	0%	22%	28%	50%	0%	3.28
Read books, articles, case studies, etc.	6%	17%	33%	33%	11%	3.28
Believe in rapid learning pace and/or fast learning curve for self	6%	33%	22%	22%	17%	3.11
Attend management development programs, product meetings, or training sessions	6%	28%	39%	22%	6%	2.94
Play with technology and/or stay updated on current technical developments	6%	28%	33%	33%	0%	2.94

Question 5 Results:

Now that you've considered essential learning activities or approaches, can you please recall and describe a learning experience that had a significant impact on your growth as a leader? Please briefly explain what you learned and at what life phase or career stage it occurred.

** The following categories emerged from the responses submitted to this question. The number of panel members who mentioned a particular topic is noted under the (No.) in the right column. The percentage of panel members who gave a particular response is also noted in the far right column. Note. n=18*

Significant learning experiences that impacted leadership growth	No.	% of total responses
Learned and gained inspiration from bosses that provided mentoring, encouraged deep & comprehensive knowledge of business, and/or asked lots of questions from many perspectives to broaden thinking	5	21.7%
Learned from advice received or a personal coach (early in career) that gave perspective on how to approach overall career outlook and/or personally assess leadership strengths	2	8.7%
Learned from another executive (not boss) by observing their proactive, positive, and constructive behaviors (examples include knowing people's names at all levels and openly working through matters with senior customer staff)	2	8.7%
Cross-cultural experience of living in another country which included many leadership lessons, learning to experiment, overcoming the fear of the unknown, and/or understanding that many issues & people behaviors are similar no matter which country you're in	2	8.7%
Learned from formal/structured activities such as from executive University programs or Oracle Leaders' Forum event which enabled global leaders to share experiences and learn from each other	2	8.7%
Past experiences working with a consultant on large scale change management or re-engineering initiatives to reinvent or improve overall organizational effectiveness	2	8.7%
Past experience in roles with wide responsibility and/or extra assignments that involved adversity or crisis management	2	8.7%
Learned from teaching or facilitating teams in my organization which enabled deeper knowledge to be personally gained in certain subjects and/or developed better understanding of team members	2	8.7%
Learned during youth years from influences such as family role models & being a captain/leader for extracurricular or school activities (such as playing sports)	2	8.7%
Learned from personal study such as reading many inspiring leadership books or doing research on best practices to implement ideas (rather than recreate the wheel)	2	8.7%
TOTAL	23	100.0%

Question 6 Results:

Please rate on a scale of 1 (not at all essential) to 5 (very essential) how essential these views or elements of communication are to you and your organization being effective.

Essential communication elements or views to being effective	1	2	3	4	5	Average
Encourage dialogue, ask questions, and effectively listen to cultivate trust and involvement	0%	0%	6%	39%	56%	4.50
Focus on high clarity and consistent messages to give clear direction	0%	0%	11%	33%	56%	4.44
Personally deliver and actively seek honest feedback	0%	0%	17%	33%	50%	4.33
Open and transparent (and somewhat informal) approach	6%	0%	11%	39%	44%	4.17
Personal humility & view employees at every level as equal and valuable	0%	6%	11%	44%	39%	4.17
Realize importance of being reachable & maintaining relationships (internally and/or with clients)	0%	0%	17%	50%	33%	4.17
Give direct and straightforward comments	6%	6%	6%	39%	44%	4.11
Share as much information from above as possible to provide insight on goals and big picture	0%	0%	22%	50%	28%	4.06
Conscious of having positive tone (even with negative matters), providing inspiration, and/or recognizing and thanking team members	0%	0%	22%	61%	17%	3.94
Deliver or want factual information	0%	6%	33%	28%	33%	3.89
Active team involvement & engage in participatory style	0%	0%	28%	61%	11%	3.83

Note. n=18

Question 7 Results:

Now that you've considered essential communication elements, please consider the technique of 'Telling A Story or Scenario' which some famous leaders have been known to use to communicate messages. Do you believe the use of 'stories' helps to increase understanding when explaining or exchanging information with others in your organization and how often (if at all) would you say 'stories' are used in your organization? Please briefly explain.

Of the responses provided by the expert panel of Oracle executives, the following EXPLICITLY stated how often 'stories' are used in their organizations.			
Not at all	Not often	Moderately	Regularly
33.3%	25%	33.3%	8.3%

Of the responses provided, the following percentages of panel members EXPLICITLY stated how helpful 'stories' are to increasing understanding with others.		
Not helpful	Sometimes helpful	Helpful
18.75%	18.75%	62.5%

Example quotes from panel members about 'stories'...
People remember stories. Leaders need to provide a vision of something that matters to the people. Why should we grow? What's in it for them? Stories of people who helped the company grow and grew with it are much more effective.
I view the use of ' stories ' to increase understanding and reinforce key messages as a good technique. However, I am not sure we shall use this technique in all occasions; rather, I find it more effective when I occasionally use it.
No stories normally - present the facts and action plan as they are.
Stories are really important. We try to regularly get people to talk about 'war stories', wins and losses. Sales meetings, sales training sessions. On a personal level, metaphors are key to changing behaviour. They provide almost a subconscious aid to gaining acceptance of a situation or required action.
I am convinced that telling a story is one of the key elements of effective communication in increasingly complex environments. From time to time I hear these kinds of stories in our organization. However, I think it happens more on an individual basis.
'Stories' are not used very often in our organization. In terms of my opinion on this, I am not sure

it applies well in a technical development environment. It is more appropriate for evoking emotions, which you can argue, could apply to our work environment but not as much as say in the political arena.

I do not believe that we have many storytellers in my organization. I think it is useful to use analogies or cite examples of like business situations to drive home what has worked in the past.

Yes, I think giving examples, or scenarios you went through before helps communicate the message more effectively. I use it often but not often enough. I still tend to 'preach' sometimes, but stories or scenarios are better. But you also need a talent to effectively use 'stories'.

Yes story telling can be effective to prove a specific point, but sometimes the facts are enough...

Using examples or 'Scenarios' is very useful as it puts some context to a discussion point. Especially when we are working in teams where English is not a first language, using examples will help to get the points across.

Stories seem to work if they have one central point that is unusual and helps people remember the whole story. At a training course 15 years ago an instructor said he was going to tell us a story which had such an interesting point in the middle that none of us would ever forget - and he was right!!

Questions 8 & 9 Results:

As you may recall from the Round One Summarized Feedback document (pg. 4), physicist Fritjof Capra (1996) considers macro level social issues and suggests why such situations or conditions may exist by connecting it to human behaviors or tendencies. Capra further explains that our human understanding requires an expansion not only of our perceptions and ways of thinking but also our values, and there is a striking connection between thinking and values. Capra suggests two human tendencies or behaviors: one tendency being labeled as 'self-assertive' and the other tendency labeled as 'integrative.' Capra notes that neither the 'self-assertive' or 'integrative' tendencies are intrinsically good or bad. Both approaches are necessary and a balance is optimal. The following chart summarizes how Capra defines the human tendencies.

Thinking		Values	
<i>Self-Assertive</i>	<i>Integrative</i>	<i>Self-Assertive</i>	<i>Integrative</i>
Rational	Intuitive	Expansion	Conservation
Analysis	Synthesis	Competition	Cooperation
Reductionist	Holistic	Quantity	Quality
Linear	Nonlinear	Domination	Partnership

(Capra, 1996, p.10)

- In your opinion, which behaviors do most leaders you currently observe tend to actually practice? (Choose One Only)

Panel members responded they observe this ACTUAL behavior:	% of total responses
Self-assertive behaviors	58.8%
Integrative behaviors	5.9%
Combination of Self-assertive and Integrative behaviors	35.3%

- In your opinion – regardless of Capra's proposed model stated above, which behaviors do you believe tend to be most effective in complex environments? (Choose One Only)

Panel members responded they believe this behavior is MOST EFFECTIVE:	% of total responses
Self-assertive behaviors	11.8%
Integrative behaviors	23.5%
Combination of Self-assertive and Integrative behaviors	64.7%

Question 10 Results:

Please briefly explain why you responded the way you did to the 2 preceding questions.

Of the expert panel member responses...
5.9% of the panel members ACTUALLY observe Integrative behaviors and believe Integrative behaviors are also MOST EFFECTIVE
<p>Example quote includes:</p> <ul style="list-style-type: none"> • Due to the complexity of the environments I believe Cooperation and Partnership are important behaviors and also believe that synthesis is critical or one could waste time with too much analysis. The 80/20 rule can be applied in many but not all cases.
11.8% of the panel members ACTUALLY observe Self-Assertive behaviors and believe Self-Assertive behaviors are also MOST EFFECTIVE
<p>Example quotes include:</p> <ul style="list-style-type: none"> • If leaders do not consistently and assertively reduce complexity in their work environments, their team's performance will be mediocre at best. Cognitive overload is the norm in complex environments, and performers constantly need to be anchored by a clear focus to deliver on their goals. • I accept that is a very competitive world. Much pressure from competitors and customers. This ruffles partnerships and co-operation in general. My view is, I suppose, very 'Western'. May be different in 'Eastern.'
17.6 % of the panel members ACTUALLY observe Self-Assertive behaviors yet believe Integrative behaviors are MOST EFFECTIVE
<p>Example quotes include:</p> <ul style="list-style-type: none"> • Actual: Oracle is full of Type A aggressive self-assertive behavior. Only the strong survive. Most effective: As things become more complex, the only way to succeed is through cooperation and partnership. • If people are not part of the process, you will never get 100% of their energy... People want to be part of the road to results, not only do what others tell them to do... • I believe the Self-Assertive approach was probably better for the type of companies we had until the globalization process (mid 90'). Now for the more complex organizations and business characteristics the Integrative behaviors has a better match.
29.4% of the panel members ACTUALLY observe Self-Assertive behaviors yet believe a Combination of Self-Assertive and Integrative behaviors are MOST EFFECTIVE
<p>Example quotes include:</p> <ul style="list-style-type: none"> • My answer to question #8 is pure observation. Answer #9: I believe a good leader reacts depending on the situation he has to deal with. • I think we have some very ineffective leadership skills in play today...some arrogance, some indecision, and very little listening. A great deal of positioning and protective behaviors. • For #8 - I think more people follow self-assertive, as it is valued/rewarded more. Of course you need to be right more often than not to be successful at it otherwise you

will not last very long. For #9 - Having some combination would be better. Does not have to be 50/50 split but clearly it would be better to be equipped for both and use them as appropriate, i.e. for some things self-assertive would work better and for some things integrative.

- Oracle is based on reaching results every month/Quarters, and in all our communication and behaviour we tend to be very result/Quantity focused - even when it comes to handling employees, which I think is a problem.

35.3% of the panel members ACTUALLY observe a Combination of Self-Assertive and Integrative behaviors and believe a Combination of Self-Assertive and Integrative behaviors are also MOST EFFECTIVE

Example quotes include:

- In today's complex organization and fast growth economy, it is difficult to seek consensus and agreement for all in terms of directions, visions and high-level strategies. That requires self-assertive behaviors to set the stage, framework and environment for the organizations to develop, perform and grow. Having said that, we do need cooperation, team engagement and mutual understanding as to create trust, team involvement an engagement for better execution and fine tuning of our directions, strategies and environment. That requires Integrative behaviors
- I believe good management is a combination of art and science
- One needs both types of thinking and values. To be a good leader and grow your business, you need to use competitive, dominating values in some cases and at the same time, need to use cooperative and partnership focused values. Similarly for the Thinking types. I agree that a good balance is essential.
- I have found that team members expect that their leaders exert a certain amount of authority and self-assertive behaviors. However in the company of peers from other LOB's, Integrative behaviours will be required to develop win-win solutions. With senior employees, integrative behaviors will achieve better results.

Note. n=18

Question 11 Results:

Please briefly discuss why you agree or disagree with the concept below and how it does or does not apply to your leadership philosophy or your work challenges.

“The fundamental insight of twentieth-century physics has yet to penetrate the social world: relationships are more fundamental than things” (Senge et al., 2004, p.199). Physicist Fritjof Capra (2002) explains, “At all levels of life, from the metabolic networks inside cells to the food webs of ecosystems and the networks of communications in human societies, the components of living systems are inter-linked in network fashion.” Linking further to social systems, Capra (1996) continues, “The more we study the major problems of our time, the more we come to realize that they cannot be understood in isolation. They are systemic problems, which means that they are interconnected and interdependent... not only do our leaders fail to see how different problems are interrelated; they also refuse to recognize how their so-called solutions affect future generations”(p.4).

Of the responses provided, the following percentages of panel members EXPLICITLY stated if they agreed with the above concept about relational and interconnected work dynamics.		
Agree	Somewhat Agree	Did not explicitly agree or disagree
76.5%	11.8%	11.8%

Example quotes from panel members about this relational and interconnected concept include:
From a leadership philosophy and ESPECIALLY an Oracle environment perspective, I 100% agree. If Oracle could get the right people to work on relationships, we would be the most successful company in the world.
I agree with this statement. In this age of cognitive overload, leaders have their hands full just simplifying all the complexity that exists in their work setting. Only the most exceptional of leaders can handle this task and, additionally, understand and act upon problems' inter-relationships.
Agree that many factors of interconnected things in life have an impact on our decision, but at the same time if all factors are to be analyzed, decisions will never be made. One needs to be pragmatic, take the most important factors into consideration and move forward. One needs to be flexible that if the decision has harmful effects on parts of the organization that she/he failed to analyze, then every rule has an exception. The mistake that Global companies make sometimes is the broad-brush concept where a decision that is good for a large market like the US is enforced on all parties without the leaders willingness to understand the impact on others and without the flexibility to accept exceptions.
I agree. The world is getting more complex because of globalization while we might lose sight of local practices and issues. Our organization is getting more complex not only because of globalization but also change in organization structure due to product scope and organization scale. They are all interconnected and related with each other. They cannot be understood in isolation. This concept will require an integrated leadership style

This presupposes that leaders can or do make the time to reflect on these issues. The volume of work and pressure to achieve short-term objectives reduces the time and energy to see the bigger picture, especially the impact on future generations. In companies such as Oracle with an inspirational leader, there is almost an upward delegation of this broader view to that leader and a belief that he has the 'answer'.

I fully agree to the concept. However, I do not see that this fully applies to the challenges I currently have as a leader. From my point of view there are decisions which have to be made very fast. These are perhaps more of an operational kind. I believe this concept applies more to very strategic decisions which very often impact the whole eco system.

I am a very strong believer in systems thinking and systemic problem solving. I try to take a step back when considering a problem to understand the symptoms, the inputs, and the processes that affect the results that are being seen. I truly believe our systems are perfectly designed to deliver the results we are getting...therefore if we are not satisfied with the results we need to rethink the system.

I agree. I think it does apply to us on a daily basis. We have to constantly struggle to simplify things to be able to make progress but inherently there are lots on inter-relationships and consequences that need to be factored in. This applies particularly to the people aspects.

I agree with this statement, as I believe many of our leaders are still short term oriented versus long term oriented and that is why execution is still a problem. I believe if we all understand better a direction we want to go to then we need to work on solving problems, creating new work that leads us to this direction. If one analyzes the cause and effect of objectives one can see the connections and that actions are not independent.

I agree that virtually everything is interconnected and few 'living systems' stand in isolation. I think that we tend to be tactical and focus on the urgent vs. the important and in our zeal to produce a revenue number or deliver a project; we sometimes ignore the other networked components. I have always been open to and actively interface with all of my virtual teams. You cannot be a lone wolf and lead.

I agree because I believe that at the end of the day in management and business we are first and foremost dealing with human beings and all of the good and bad that comes with that. I believe 90% of the battle is in touching the right aspect of people in order to get them to behave the way you would like them to. And this is directly related to the above statement

I agree that all situations are inter related and interdependent. Situations/problems we face in our day-to-day work - demand generation, skill deployment, managing talent and attrition, projects delivery, etc cannot be looked at in isolation. We need to understand the impact of solving one problem on other areas.

Agree, from very local environments - offices, we are going more and more to global organisations and virtual teams. The close working relationships will go away and are exchanged to technology relationships (e-mails, web-casts, etc). The company/office culture is going away...

I agree basically because networking inside and outside the company and understanding the ecosystem are key elements to being successful in today's business world. It applies to my leadership philosophy since I believe helping our people to be aware of this changing environment, and the importance of inter-networking, is key to being successful

Agree. I believe we should always learn from previous experiences. But it is important to see every new problem with new light, as there are different people and different environmental factors involved.

I agree - and I think it's clear how it applies to leadership and work challenges - Oracle is not a small company selling simplistic products - we're very big and selling sophisticated pieces of software that need a lot of factors to work together to get the best level of success.

Question 12 Results:

OPTIONAL QUESTION – Given the Round One Summarized Feedback and this second round of questions, are you particularly interested in a certain topic or question? Is there something you have discovered, reflected upon, or would like to explore further with this executive community?

Of the responses submitted, the following categories of comments were raised:

Comments related to the previous question (question 11 – about relational aspect):

- I do believe the company has a very reactive culture that solves problems with point solutions targeted at symptoms and not the system. We see this in the many orgs and roles that are defined to be the downstream correction point for problems that needed to be solved upstream. System thinking.
- It would be interesting to hear what some of the most effective leaders in today's world do on a daily basis. What skills do they think are important? We have heard from the Physicist, how about a business leader?
- Actually I found this last question to be interesting – I have thought about this a lot.

Comments about balancing global or local direction:

- I am personally interested in Global, virtual or multi-cultural challenges, particularly.... balancing between global and local decisions, perspectives and practices
- For me, the balance of corporate direction and local culture/dynamics is key. Addressing this balance may significantly assist organisational development and growth.

Comments related to communications:

- I think it would be good to continue to focus on communication. I see over and over again in many businesses that we still do not communicate information. Maybe we could work on means of communications. We could work on communicating 7 times in 7 different ways like: Meetings, visits to employees, Quarterly letters/newsletters, Learning lunches, intranet, working groups, staff briefings.
- I am especially interested in the communication topic.

Comment related to creating a support network of trusted peers:

- We used to have trusted peers, someone you could go to and discuss questions around work. Now we work with e-mail addresses and approval chains, some of whom we have never met in real life. Where can I go to discuss challenges at work?

APPENDIX K

ROUND THREE QUESTIONNAIRE

Appendix K

Round Three Questionnaire

1. In the Round Two Questionnaire, the majority of expert panel members rated the following challenges as important or very important. Please rank (order) the following panel-cited challenges from 1 (most important) to 6 (least important) in terms of challenges that leaders must be proficient at managing if they are to be effective, especially in a complex environment. Each ranking number may be used only once.

_____ Providing clear direction and being able to effectively connect with virtual team members distributed across time zones

_____ Attracting, retaining, and motivating employees, especially Top Talent

_____ Cognitive agility to make the complex simple and navigate uncertainty

_____ Collaborating and operating effectively across multiple Lines of Business & disciplines and thinking from other perspectives (customer, LOBs, or co-worker perspectives) to enhance overall organizational effectiveness

_____ Ability to process & filter extensive information to make appropriate decisions

_____ Developing or finding (cultivating) managers with strong leadership skills

2. In the Round Two questions, expert panel members reported the following learning experiences as having a significant impact on their growth as a leader. In an ideal world, please rate the “significant learning experiences” you would hope or recommend future leaders have in order to grow their leadership capacity.

Please rate on a scale of 1 (most important) to 5 (least important) the most important learning experiences future leaders would ideally have. Please carefully differentiate the importance of each item as much as possible (for example - not rate everything as a 1).

In an ideal world, rate the significant learning experiences you would hope future leaders have in order to grow their leadership capacity	Rating
To learn and gain inspiration from bosses that provide mentoring, encourage deep & comprehensive knowledge of business, and/or ask lots of questions from many perspectives to broaden thinking	

To learn from advice received or a personal coach (early in career) that gave perspective on how to approach overall career outlook and/or personally assess leadership strengths	
To learn from another executive (not boss) by observing their proactive, positive, and constructive behaviors (examples include knowing people's names at all levels and openly working through matters with senior customer staff)	
To have a cross-cultural experience of living in another country which includes many leadership lessons, learning to experiment, overcoming the fear of the unknown, and/or understanding that many issues & people behaviors are similar no matter which country you're in	
To learn during youth years from influences such as family role models and/or being a captain/leader for academic or extracurricular activities (such as playing sports or music)	
To learn from teaching or facilitating teams in their organization which enable deeper knowledge to be personally gained in certain subjects and/or better understanding of team members to be developed	
To learn from personal study such as reading many inspiring leadership books or doing research on best practices to implement ideas (rather than recreate the wheel)	
To learn from formal/structured activities such as from executive University programs or Oracle Leaders' Forum events which enable global leaders to share experiences and learn from each other	
To have experiences working with a consultant on large scale change management or re-engineering initiatives to reinvent or improve overall organizational effectiveness	
To gain experience in roles with wide responsibility and/or extra assignments that involve adversity or crisis management	

3. In your opinion, when do most highly effective leaders tend to develop their skills to manage complexity and/or when are the optimal time periods to teach such skills to prepare leaders?

Please rank (order) from 1 (most important) to 7 (least important) the most IMPORTANT time periods for a leader's growth. Each ranking number may be used only once.

- Youth or adolescent years
- College, university, or graduate studies
- First 5 years of career/working experience
- 5 – 10 years of career/working experience
- Middle stages of career
- Later stages of career
- At critical points in their career journey (promotions, unexpected setbacks, etc.)

4. In the Round One Summarized Feedback document, characteristics of a Complex Adaptive System were defined in response to the many complex work challenges the expert panel shared. Based on this understanding, it is important to examine the trait that separates human beings from all other living organisms in complex systems: the ability to learn. The cognitive capacity of human beings is what distinguishes us from any other living organism. That, in itself, illustrates the significance of such a unique behavior that has the potential to considerably impact a complex system.

Traditionally, rationalist thinking in organizations – which focuses on long-term planning, causality, and hierarchical power structures – has dominated management practice since Newton and Descartes. Rationalism is based on the notion that outcomes can be predicted and controlled with the right thinking in place. However, there is now an increased interest in the application and relevance of complexity theory to social systems. Simply put, the key finding claimed for complexity theory is the “effective unknowability of the future” (Rosenhead, 1998). Given this, how learning is fostered in organizations becomes critically important, because seeking stable equilibrium in an inherently unpredictable environment and over-valuing a common culture will lead to failure. Researchers have indicated that complexity leaders need to have a great capacity for learning and be instrumental in their own and their organization’s learning. A leader’s learning and their ability to facilitate dialogue and “[activate] the tacit knowledge and creativity available within the organization” is what Stacey (2001), an influential management complexity author, defines as a critical requirement of extraordinary management.

With this general idea in mind, do you have some creative or unique ideas on what complexity leaders can do to promote meaningful learning that enables optimal decisions to be made in their organizations (e.g., mentoring programs; tell ‘stories’ to create understanding; global assignments; practice deep listening by suspending one’s own bias and habits; informal learning circles; explicitly identify organizational norms that can limit performance, etc.)? Please BRIEFLY explain.

5. In the Round Two questions, 88.3% of the expert panel members explicitly stated they agreed with Physicist Fritjof Capra’s concept about the relational and interconnected nature of problems and that “components of living systems are inter-linked in network fashion... and cannot be understood in isolation.”

Building upon this concept, Arie de Geus, retired Shell executive and author of *The Living Company* (named one of Business Week’s Ten Best Books), examined the question of corporate longevity and studied 27 large corporations around the world that had existed for over a hundred years, had survived major changes in the world around them, and were still flourishing with their corporate identities intact. He concluded that resilient, long-lived companies are those that exhibit the behavior and certain characteristics of “living” entities (as juxtaposed with the metaphor of “machine-like” behaviors which have often dominated corporate ways).

De Geus (2002) states, “Basic economic theory tells us that there have always been three key sources of wealth: land and natural resources, capital (and the accumulation and reinvestment of possessions), and labor... Sometime over the course of the twentieth century, the Western nations moved out of the age of capital, however, and into the age of knowledge... After the Second World War, an enormous capital accumulation began. Individuals and banks and companies became much more resilient. Technology also began to change, thanks to telecommunications, television, computers, and commercial air travel, with the effect of making capital far more fungible and resilient, easier to move around – and consequently less scarce. With capital easily available, the critical production factor shifted to people. But it did not shift to simple labor. Instead, knowledge displaced capital as the scarce production factor – the key to corporate success... All of these brain-rich companies cannot be managed in the old asset-oriented style. Their managers have had to shift their priorities, from running companies to optimize capital, to running companies to optimize people. People, in these companies, are the carriers of knowledge and therefore the source of competitive advantage... This gives us an entirely different imperative for corporate success. A successful company is one that can learn effectively... That is why we need a new way of thinking about the measurement of success in our companies. By outsiders, we are judged and measured in economic terms: return on investment and capital assets. But within the company, our success depends on our skill with human beings: building and developing the consistent knowledge base of our enterprise” (pp.17-21). De Geus (2002) continues, “In the years ahead, as developing countries expand their standards of living, corporations will be more needed than ever.” He explains commercial corporations have only been around a short time – 500 years – in comparison to the existence of human civilization. While they have been successful in terms of producing wealth, de Geus declares most commercial corporations are dramatic failures in light of their potential. “The average life expectancy of a multinational corporation – Fortune 500 or equivalent – is between 40 and 50 years... Human beings have learned to survive, on average, for 75 years or more, but there are very few companies that are that old and flourishing” (p.1). De Geus believes the “sharp difference between [the] two definitions – the economic company definition and the learning company definition – lies at the core of the crisis managers face today. The tension between them is almost certainly one of the key reasons behind the surprisingly low average life expectancy of companies in the northern hemisphere” (p. 21). The brain of an individual human being can more easily perceive, adapt to, and actively engage with its environment than a corporation can, so de Geus suggests leaders need to take specific action to help companies improve their powers of perception and change to match the outside world before situations become crises.

Do you agree or disagree with the concepts of the “economic company” and the “learning company” and does there need to be a new way of thinking about how companies measure success? Please BRIEFLY explain.

6. Over the course of Rounds 1 and 2, the majority of expert panel members suggested and ranked the following 'Learning' approaches as essential and very essential.

Essential Learning approaches or worldviews

- Actively learn from others by asking key questions, seeking multiple perspectives, or problem solving together
- Be open to new ideas and learning new things - view every problem as an opportunity
- Learn (in general) from each interaction with people (team members, boss, and/or peers)
- Learn (in general) from each experience, challenge, and the environment itself
- Actively learn by doing and from willingness to possibly making mistakes
- Be willing to be out of comfort zone when taking action and learn from mistakes

- How often do leaders you observe in your organization practice the above approaches to learning?
- Consistently
 - Moderately
 - Sometimes but not often enough
 - Not at all

7. Over the course of Rounds 1 and 2, the majority of expert panel members suggested and ranked the following 'Communications' approaches as essential and very essential.

Essential Communication approaches or worldviews

- Encourage dialogue, ask questions, and effectively listen to cultivate trust and involvement
- Focus on high clarity and consistent messages to give clear direction
- Personally deliver and actively seek honest feedback
- Be open and transparent (and somewhat informal approach)
- Have personal humility & view employees at every level as equal and valuable
- Realize importance of being reachable & maintaining relationships (internally and/or with clients)

- How often do leaders you observe in your organization practice the above approaches to communications?
- Consistently
 - Moderately
 - Sometimes but not often enough
 - Not at all

8. How helpful do you think it would be to a team's overall effectiveness to EXPLICITLY discuss, encourage or reward the above learning and communications approaches as the operating norms?
 - It would be VERY helpful
 - It would be SOMEWHAT helpful
 - It would be LITTLE TO NO help
 - Uncertain if it would make a difference

9. "The human mind is a particularly interesting device that displays remarkable adaptiveness and intelligence" (Anderson, 2000, p. 2). Few would dispute this claim that is strongly supported by cognitive science research; yet it is curious why so many people resist or have difficulty embracing change. Wheatley (1999) asserts that people tend not to "work with the forces of change. We act quite the opposite; we need to manage change and keep it under control every cautious step of the way. And we think we're being helpful to others when we manage change so carefully, because we believe that people don't like change. Strangely, we assert that it's a particular characteristic of the human species to resist change... even though we're surrounded by tens of millions of other species that demonstrate wonderful capacities to grow, adapt, and change" (p. 138).

 In general, do you observe adaptive behaviors in your organization (YES or NO) and why do you think people either embrace or resist change? Please BRIEFLY explain.

10. How do you describe your purpose for leading? In other words, what gives you meaning and gets you out of bed in the morning? Why do you desire to lead? Please BRIEFLY explain.

11. OPTIONAL LAST QUESTION – Please feel free to comment here on anything else you would like to say related to the topics discussed in this study.

APPENDIX L

ROUND THREE: COMPILED RESULTS

Appendix L

Round Three: Compiled Results

Note – The labels included in this summary indicate the following:

Consistent Group – Panel members that completed all three Rounds of questions (n=18)

Additional Group – Panel members that completed Rounds One and Three (n=7)

Comprehensive Group – Panel members in the Consistent and Additional Groups (n=25)

Font in the tables indicates the following:

Regular font – Results from panel members in the Consistent Group

Italics font – Results from panel members in the Additional Group

Bold font – Results from the Comprehensive Group

1. In the Round Two Questionnaire, the majority of expert panel members rated the following challenges as important or very important. Please rank (order) the following panel-cited challenges from 1 (most important) to 6 (least important) in terms of challenges that leaders must be proficient at managing if they are to be effective, especially in a complex environment. Each ranking number may be used only once.

Table of Consistent Group

Most important challenges for leaders to be adept at handling	1	2	3	4	5	6	Response Average
Attracting, retaining, and motivating employees, especially Top Talent	39%	39%	11%	0%	11%	0%	2.06
Developing or finding (cultivating) managers with strong leadership skills	11%	17%	39%	22%	6%	6%	3.11
Collaborating and operating effectively across multiple Lines of Business & disciplines and thinking from other perspectives (customer, LOBs, or co-worker perspectives) to enhance overall organizational effectiveness	22%	17%	0%	17%	28%	17%	3.61
Cognitive agility to make the complex simple and navigate uncertainty	0%	22%	28%	17%	28%	6%	3.67
Providing clear direction and being able to effectively connect with virtual team members distributed across time zones	17%	6%	22%	17%	11%	28%	3.83
Ability to process & filter extensive information to make appropriate decisions	11%	0%	0%	28%	17%	44%	4.72

Table of Additional Group

Most important challenges for leaders to be adept at handling	1	2	3	4	5	6	Response Average
Attracting, retaining, and motivating employees, especially Top Talent	14%	43%	0%	14%	29%	0%	3.00
Providing clear direction and being able to effectively connect with virtual team members distributed across time zones	29%	0%	0%	57%	14%	0%	3.29
Ability to process & filter extensive information to make appropriate decisions	14%	14%	43%	0%	14%	14%	3.29
Developing or finding (cultivating) managers with strong leadership skills	14%	14%	29%	14%	14%	14%	3.43
Collaborating and operating effectively across multiple Lines of Business & disciplines and thinking from other perspectives (customer, LOBs, or co-worker perspectives) to enhance overall organizational effectiveness	14%	14%	14%	14%	29%	14%	3.71
Cognitive agility to make the complex simple and navigate uncertainty	14%	14%	14%	0%	0%	57%	4.29

Table of Comprehensive Group

Most important challenges for leaders to be adept at handling	1	2	3	4	5	6	Response Average
Attracting, retaining, and motivating employees, especially Top Talent	32%	40%	8%	4%	16%	0%	2.32
Developing or finding (cultivating) managers with strong leadership skills	12%	16%	36%	20%	8%	8%	3.20
Collaborating and operating effectively across multiple Lines of Business & disciplines and thinking from other perspectives (customer, LOBs, or co-worker perspectives) to enhance overall organizational effectiveness	20%	16%	4%	16%	28%	16%	3.64
Providing clear direction and being able to effectively connect with virtual team members distributed across time zones	20%	4%	16%	28%	12%	20%	3.68
Cognitive agility to make the complex simple and navigate uncertainty	4%	20%	24%	12%	20%	20%	3.84
Ability to process & filter extensive information to make appropriate decisions	12%	4%	12%	20%	16%	36%	4.32

2. In the Round Two questions, expert panel members reported the following learning experiences as having a significant impact on their growth as a leader. In an ideal world, please rate the “significant learning experiences” you would hope or recommend future leaders have in order to grow their leadership capacity.

Please rate on a scale of 1 (most important) to 5 (least important) the most important learning experiences future leaders would ideally have. Please carefully differentiate the importance of each item as much as possible (for example - not rate everything as a 1).

Table of Consistent Group

In an ideal world, rate the significant learning experiences you would hope future leaders have in order to grow their leadership capacity	1	2	3	4	5	Response Average
To gain experience in roles with wide responsibility and/or extra assignments that involve adversity or crisis management	39%	44%	11%	6%	0%	1.83
To learn from another executive (not boss) by observing their proactive, positive, and constructive behaviors (examples include knowing people's names at all levels and openly working through matters with senior customer staff)	33%	44%	17%	6%	0%	1.94
To learn and gain inspiration from bosses that provide mentoring, encourage deep & comprehensive knowledge of business, and/or ask lots of questions from many perspectives to broaden thinking	39%	22%	28%	11%	0%	2.11
To have a cross-cultural experience of living in another country which includes many leadership lessons, learning to experiment, overcoming the fear of the unknown, and/or understanding that many issues & people behaviors are similar no matter which country you're in	22%	33%	33%	0%	11%	2.44
To have experiences working with a consultant on large scale change management or re-engineering initiatives to reinvent or improve overall organizational effectiveness	17%	22%	33%	28%	0%	2.72
To learn from advice received or a personal coach (early in career) that gave perspective on how to approach overall career outlook and/or personally assess leadership strengths	0%	61%	11%	17%	11%	2.78
To learn from teaching or facilitating teams in their organization which enable deeper knowledge to be personally gained in certain subjects and/or better understanding of team members to be developed	6%	44%	28%	11%	11%	2.78

To learn during youth years from influences such as family role models and/or being a captain/leader for academic or extracurricular activities (such as playing sports or music)	11%	28%	28%	28%	6%	2.89
To learn from formal/structured activities such as from executive University programs or Oracle Leaders' Forum events which enable global leaders to share experiences and learn from each other	11%	17%	56%	6%	11%	2.89
To learn from personal study such as reading many inspiring leadership books or doing research on best practices to implement ideas (rather than recreate the wheel)	11%	11%	44%	11%	22%	3.22

Table of Additional Group

In an ideal world, rate the significant learning experiences you would hope future leaders have in order to grow their leadership capacity	1	2	3	4	5	Response Average
To learn and gain inspiration from bosses that provide mentoring, encourage deep & comprehensive knowledge of business, and/or ask lots of questions from many perspectives to broaden thinking	86%	0%	14%	0%	0%	1.29
To gain experience in roles with wide responsibility and/or extra assignments that involve adversity or crisis management	71%	14%	0%	14%	0%	1.57
To learn from another executive (not boss) by observing their proactive, positive, and constructive behaviors (examples include knowing people's names at all levels and openly working through matters with senior customer staff)	43%	43%	14%	0%	0%	1.71
To learn from advice received or a personal coach (early in career) that gave perspective on how to approach overall career outlook and/or personally assess leadership strengths	0%	71%	14%	14%	0%	2.43
To learn from teaching or facilitating teams in their organization which enable deeper knowledge to be personally gained in certain subjects and/or better understanding of team members to be developed	14%	29%	29%	29%	0%	2.71
To have a cross-cultural experience of living in another country which includes many leadership lessons, learning to experiment, overcoming the fear of the unknown, and/or understanding that many issues & people behaviors are similar no matter which country you're in	0%	43%	0%	43%	14%	3.29

To learn from personal study such as reading many inspiring leadership books or doing research on best practices to implement ideas (rather than recreate the wheel)	14%	29%	14%	0%	43%	3.29
To learn during youth years from influences such as family role models and/or being a captain/leader for academic or extracurricular activities (such as playing sports or music)	14%	0%	43%	14%	29%	3.43
To learn from formal/structured activities such as from executive University programs or Oracle Leaders' Forum events which enable global leaders to share experiences and learn from each other	0%	0%	43%	57%	0%	3.57
To have experiences working with a consultant on large scale change management or re-engineering initiatives to reinvent or improve overall organizational effectiveness	0%	0%	29%	57%	14%	3.86

Table of Comprehensive Group

In an ideal world, rate the significant learning experiences you would hope future leaders have in order to grow their leadership capacity	1	2	3	4	5	Response Average
To gain experience in roles with wide responsibility and/or extra assignments that involve adversity or crisis management	48%	36%	8%	8%	48%	1.76
To learn and gain inspiration from bosses that provide mentoring, encourage deep & comprehensive knowledge of business, and/or ask lots of questions from many perspectives to broaden thinking	52%	16%	24%	8%	52%	1.88
To learn from another executive (not boss) by observing their proactive, positive, and constructive behaviors (examples include knowing people's names at all levels and openly working through matters with senior customer staff)	36%	44%	16%	4%	36%	1.88
To learn from advice received or a personal coach (early in career) that gave perspective on how to approach overall career outlook and/or personally assess leadership strengths	0%	64%	12%	16%	0%	2.68
To have a cross-cultural experience of living in another country which includes many leadership lessons, learning to experiment, overcoming the fear of the unknown, and/or understanding that many issues & people behaviors are similar no matter which country you're in	16%	36%	24%	12%	16%	2.68

To learn from teaching or facilitating teams in their organization which enable deeper knowledge to be personally gained in certain subjects and/or better understanding of team members to be developed	8%	40%	28%	16%	8%	2.76
To learn during youth years from influences such as family role models and/or being a captain/leader for academic or extracurricular activities (such as playing sports or music)	12%	20%	32%	24%	12%	3.04
To have experiences working with a consultant on large scale change management or re-engineering initiatives to reinvent or improve overall organizational effectiveness	12%	16%	32%	36%	12%	3.04
To learn from formal/structured activities such as from executive University programs or Oracle Leaders' Forum events which enable global leaders to share experiences and learn from each other	8%	12%	52%	20%	8%	3.08
To learn from personal study such as reading many inspiring leadership books or doing research on best practices to implement ideas (rather than recreate the wheel)	12%	16%	36%	8%	12%	3.24

3. In your opinion, when do most highly effective leaders tend to develop their skills to manage complexity and/or when are the optimal time periods to teach such skills to prepare leaders?

Please rank (order) from 1 (most important) to 7 (least important) the most IMPORTANT time periods for a leader's growth. Each ranking number may be used only once.

Table of Consistent Group

Optimal time periods to prepare leaders	1	2	3	4	5	6	7	Response Average
5 – 10 years of career/working experience	50%	11%	22%	6%	6%	6%	0%	2.22
Middle stages of career	11%	39%	11%	6%	11%	22%	0%	3.33
At critical points in their career journey (promotions, unexpected setbacks, etc.)	17%	22%	17%	11%	17%	17%	0%	3.39
First 5 years of career/working experience	11%	11%	22%	33%	11%	6%	6%	3.61
College, university, or graduate studies	0%	6%	22%	22%	22%	22%	6%	4.50
Youth or adolescent years	11%	11%	6%	17%	17%	11%	28%	4.61
Later stages of career	0%	0%	0%	6%	17%	17%	61%	6.33

Table of Additional Group

Optimal time periods to prepare leaders	1	2	3	4	5	6	7	Response Average
5 – 10 years of career/working experience	57%	29%	0%	14%	0%	0%	0%	1.71
Middle stages of career	14%	29%	43%	14%	0%	0%	0%	2.57
At critical points in their career journey (promotions, unexpected setbacks, etc.)	0%	29%	14%	29%	14%	14%	0%	3.71
College, university, or graduate studies	14%	14%	14%	0%	43%	14%	0%	3.86
First 5 years of career/working experience	14%	0%	14%	29%	14%	14%	14%	4.29
Later stages of career	0%	0%	14%	0%	14%	43%	29%	5.71
Youth or adolescent years	0%	0%	0%	14%	14%	14%	57%	6.14

Table of Comprehensive Group

Optimal time periods to prepare leaders	1	2	3	4	5	6	7	Response Average
5 – 10 years of career/working experience	52%	16%	16%	8%	4%	4%	0%	2.08
Middle stages of career	12%	36%	20%	8%	8%	16%	0%	3.12
At critical points in their career journey (promotions, unexpected setbacks, etc.)	12%	24%	16%	16%	16%	16%	0%	3.48
First 5 years of career/working experience	12%	8%	20%	32%	12%	8%	8%	3.80
College, university, or graduate studies	4%	8%	20%	16%	28%	20%	4%	4.32
Youth or adolescent years	8%	8%	4%	16%	16%	12%	36%	5.04
Later stages of career	0%	0%	4%	4%	16%	24%	52%	6.16

4. *In the Round One Summarized Feedback document, characteristics of a Complex Adaptive System were defined in response to the many complex work challenges the expert panel shared. Based on this understanding, it is important to examine the trait that separates human beings from all other living organisms in complex systems: the ability to learn. The cognitive capacity of human beings is what distinguishes us from any other living organism. That, in itself, illustrates the significance of such a unique behavior that has the potential to considerably impact a complex system. Traditionally, rationalist thinking in organizations - which focuses on long-term*

planning, causality, and hierarchical power structures - has dominated management practice since Newton and Descartes. Rationalism is based on the notion that outcomes can be predicted and controlled with the right thinking in place. However, there is now an increased interest in the application and relevance of complexity theory to social systems. Simply put, the key finding claimed for complexity theory is the 'effective unknowability of the future' (Rosenhead, 1998). Given this, how learning is fostered in organizations becomes critically important, because seeking stable equilibrium in an inherently unpredictable environment and over-valuing a common culture will lead to failure. Researchers have indicated that complexity leaders need to have a great capacity for learning and be instrumental in their own and their organization's learning. A leader's learning and their ability to facilitate dialogue and '[activate] the tacit knowledge and creativity available within the organization' is what Stacey (2001), an influential management complexity author, defines as a critical requirement of extraordinary management. With this general idea in mind, do you have some creative or unique ideas on what complexity leaders can do to promote meaningful learning that enables optimal decisions to be made in their organizations (e.g., mentoring programs; tell 'stories' to create understanding; global assignments; practice deep listening by suspending one's own bias and habits; informal learning circles; explicitly identify organizational norms that can limit performance, etc.)? Please BRIEFLY explain your ideas.

***All Expert Panel responses are included below. The categories emerged from the responses provided. Categories are not meant to be mutually exclusive but rather intended to provide a helpful organizing framework to consider the learning suggestions.**

Individual Techniques to encourage learning and development...	Mentoring programs/support to encourage learning and development...
<ul style="list-style-type: none"> • Ensure all have learning objectives - formal or informal - in their annual objectives that are not related to their specific role. • Global (cross cultural) assignments • Job rotation - active encouragement to people, especially management, to rotate their jobs/role every few years so they learn by experiencing different roles, taking risks in roles that they are not familiar with and learning from the unexpected. • <i>We should have suggested reading of the best leadership books out there.</i> • <i>Cross-functional and cross geographic assignments to break</i> 	<ul style="list-style-type: none"> • Have a mentoring support (program) using senior leaders as mentors (not in own organisational structure). • Much of what you learn is 'on the job.' Most successful sales executives that I know had a strong mentor early in their careers. If they were really fortunate, they had one at mid career as well. Because of this, I stress with my managers that they need to be very involved with their people... Making calls on customers, participating in role-play exercises in meetings, and of course, an active mentoring program. • Active Mentoring program where

<p><i>barriers and allow cross fertilization of best practices.</i></p>	<p>every employee has a mentor in our organization. Learn through active interaction with their seniors.</p>
<p>Manager Techniques for sharing and exchanging knowledge/ideas...</p> <ul style="list-style-type: none"> • Use a lot of passion and I try to relate stories to the audience, try to have them look at the problem through the customer's lenses. • Provide informal, brief training/discussion opportunities with my Director staff at least 1 or 2X monthly. Usually I'll devote part or all of a 1-hour staff meeting to helping my Directs become better at managing complexity. I break the subject down into many of the discrete skills cited in this study, share my own insights on how to master each skill, and then engage my staff to discuss their own experiences. • Systems thinking is a key learning opportunity for all managers. The ability to work backwards from results to understand inputs, processes and environmental factors is critical. • Have a 'reason for being' deep dive discussion. Why do we exist? What value should we drive for customers and internally? We need to continue to ask ourselves these hard questions. When I engage my team, we do not assume anything and start with 'reason for being'...I find myself now being reminded by my team when I forget/fast forward without this discussion. • Ask direct reports to look at problems from a client or other LOB perspective seems to help with learning. Ideas and suggestions become more Oracle 	<p>Team Techniques to encourage learning and development...</p> <ul style="list-style-type: none"> • Openly promote the effective use of virtual special interest groups. • Have HQ / local country leader learning circles - the intent is to bridge the gap between Corporate and Local countries as well as to allow mutual learning and understanding. • (Individually or in) groups look at challenges cross-organisation or cross-LOB. Someone from the outside will have the opportunity to look at challenges and strategy related issues with fresh and open eyes. It's a learning experience for both parties. • Leaders and their leadership teams could reserve a couple of weeks per year in their agendas in order to spend time acting in one of the basic roles in their organizations, e.g. in customer service, development, etc. • We have an Annual Best Practices Summit where all management learns from each other in a formal 2-day session full of presentations and discussion groups. • Employee empowerment: Actively involve employees of your organization, including the lowest level employee to participate in the decision making process. Form employee committees, and have them lead/participate in various organization initiatives. As an example: we are defining our organization Mission, Vision, organization Value and Strategy

<p>oriented and less LOB oriented. Getting to this point needs some coaching to avoid stereotyping - i.e. the view that some decisions NOT to do follow a course of action are easy to take if you don't think through the consequences for another team.</p> <ul style="list-style-type: none"> • Delegate project-based responsibilities earlier than you feel comfortable doing so. • <i>Use an image to support the story where appropriate to connect with those who find pictures more meaningful.</i> • <i>Sharing stories of what works and what doesn't is always a strong motivator. We must review our history and learn from it or else we repeat it.</i> • <i>Practice 'narrating' to key potential leaders: rather than just make decisions and hand them down, leaders/mentors should take subordinates 'behind the curtain' and explain the decision making process and thoughts behind it.</i> 	<p>and we are actively involving a large section of our employees.</p> <ul style="list-style-type: none"> • Have an active Development program and hence foster continuous learning. We have an active Leadership Development program and as a result, senior managers are going back to college, taking MBA programs, etc. We also have a Consultant Development program with various technical and soft skills development being offered through the years. • <i>Create learning communities that cross regions & lines of business. Doing so creates an environment where leaders & future leaders gain a broader perspective on the markets in which their businesses operate and better understand issues, trends and opportunities from a global point of view. I view this as a vital learning process for future global business leaders.</i> • <i>Simply put, I think we need Leadership training not just Management (HR practices) training. It could be lectures from respected leaders every 3-6 months that emphasize what is important. You've identified some of the important points in your question. Those leaders could be leaders from Oracle or Commerce or Government.</i>
<p>How to cultivate a learning environment and ownership in it...</p> <ul style="list-style-type: none"> • Be positive and get trust through integrity and transparency. Be sure people share the values and vision (check that up every single day). Always raise the bar setting the example. 	<p>What is NOT helpful for learning...</p> <ul style="list-style-type: none"> • We do have several org norms that get in the way of creating a learning environment. Managers are not empowered to make decisions and feel responsible for the results. Especially middle managers. We are not often given

<ul style="list-style-type: none"> • Have a Comprehensive Knowledge Management Process and system. A simple example: After Action Reviews are done for many projects, activities, and events, garner learning from them and give feedback to rest of related organization. • It is good for an organization to have a vision and a strategy. With this strategy you will have objectives and each individual can see where they fit into and how they can help achieve this strategy. Within this there are also initiatives and the initiatives have owners. By being an owner one can learn not only to work with people but also to set targets, milestones, and gain knowledge. • Listening. When an organization employs a lot of expensive people who are experts in their own domain, geography, product, etc., just telling them what to do rather than trying to consult with them is a pure waste. Nobody has global knowledge of everything. A learning organization must find effective ways using virtual methods to collect input before making decisions and using the brainpower to help accelerate productivity and growth rather than asking people to leave their brains in the car park and dictate to them what to do. • <i>Encourage continuous learning by ongoing practice of post-action reviews. These can take place after a major deliverable from the team is made, after an event such as an all-hands meeting etc.</i> 	<p>the opportunity to see the expected results, and build the plan or roadmap to achieve those results... we are asked to do no worse than last qtr. No quarterly or yearly plan to develop strategies around; just don't spend anymore than last quarter. Very un-empowering.</p> <ul style="list-style-type: none"> • Excessive short-term orientation and fragmentation. Obsession for results can lead to the opposite. • Short intensive learning experiences are very effective. I do not believe in long learning programs as universities/business schools (long MBAs). • Learning Strategy. Moving without a direction is a waste of time and energy. Many people talk about strategy but fail to articulate what strategy means. When leaders of the world, for example, are called to a meeting costing millions of dollars where the contents delivered are created a night before and do not pass a junior student in an MBA class, and then the leaders are asked to communicate the strategy. You meet some in the lobby and most of them say, what strategy? And, you fail to explain to them because you don't know. You struggle the whole day to take one note without luck. Creating a strategic intent and communicating it is one of the key roles of leadership. Getting buy in by participation is another role.
<p>Encourage risk-taking culture...</p> <ul style="list-style-type: none"> • Create culture that gives 'permission' to innovate, be 	<p>Mindset or Worldview about learning...</p> <ul style="list-style-type: none"> • There is a Chinese saying that goes 'Learning happens when the

<p>different, and to make mistakes. Allow space to experiment.</p> <ul style="list-style-type: none"> • Encourage people to leave their comfort zone and reward risk-taking action. Teach, Coach, and Motivate. • Reward success and at least acknowledge the effort of those who tried and failed. People should not be afraid of failing and as a result not trying. This is a major problem, especially in sales. People decide not to engage because they say the deal is wired for the competition. They need to engage even if they know 100% they will fail and need to get rewarded if they give the competition a hard time, because we learn, and if we don't learn from the difficult deals, we will never win. 	<p>Student Appears'. Unfortunately, people are so complex and come from varied education and social backgrounds. The students are all different. So I think if there is a talent to be retained and developed, we need to enable the individual to understand himself/herself and counsel him/her to identify the type of training best suited for him to learn and grow. I do think that it is important that the manager must always remain open-minded and have an attitude to continually learn. I think that will inculcate an environment of learning and solutions seeking in the workplace.</p> <ul style="list-style-type: none"> • I believe much of this trait [of learning] is inherent in people and to a large degree cannot be learned. I believe that clear goals and flexibility in how those goals should be achieved can facilitate this type of behaviour but much of it cannot be learned • Long term planning in my opinion is not by creating plans but by putting the right ecosystem in place where over a period of time, the organization gains strength even if no formal initiatives are provided. Long term planning is about making sure that time is on our side and not about creating documents. • Be direct and give honest and open feedback • Learn by doing. People tend to become experts in things that they practice. Organizations have little patience to develop experts or top talent. It takes years for somebody to become a real strong asset in an organization and it takes one day to lose him or her. • <i>Over communicate and have a</i>
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	<p><i>compelling vision that can be articulated in simple terms.</i></p> <ul style="list-style-type: none"> • <i>Personalise and give people a sense of who you are to make the message more compelling.</i>
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5. In the Round Two questions, 88.3% of the expert panel members explicitly stated they agreed with Physicist Fritjof Capra's concept about the relational and interconnected nature of problems and that "components of living systems are inter-linked in network fashion... and cannot be understood in isolation."

Building upon this concept, Arie de Geus, retired Shell executive and author of *The Living Company* (named one of Business Week's Ten Best Books), examined the question of corporate longevity and studied 27 large corporations around the world that had existed for over a hundred years, had survived major changes in the world around them, and were still flourishing with their corporate identities intact. He concluded that resilient, long-lived companies are those that exhibit the behavior and certain characteristics of "living" entities (as juxtaposed with the metaphor of "machine-like" behaviors which have often dominated corporate ways).

De Geus (2002) states, "Basic economic theory tells us that there have always been three key sources of wealth: land and natural resources, capital (and the accumulation and reinvestment of possessions), and labor... Sometime over the course of the twentieth century, the Western nations moved out of the age of capital, however, and into the age of knowledge... After the Second World War, an enormous capital accumulation began. Individuals and banks and companies became much more resilient. Technology also began to change, thanks to telecommunications, television, computers, and commercial air travel, with the effect of making capital far more fungible and resilient, easier to move around – and consequently less scarce. With capital easily available, the critical production factor shifted to people. But it did not shift to simple labor. Instead, knowledge displaced capital as the scarce production factor – the key to corporate success... All of these brain-rich companies cannot be managed in the old asset-oriented style. Their managers have had to shift their priorities, from running companies to optimize capital, to running companies to optimize people. People, in these companies, are the carriers of knowledge and therefore the source of competitive advantage... This gives us an entirely different imperative for corporate success. A successful company is one that can learn effectively... That is why we need a new way of thinking about the measurement of success in our companies. By outsiders, we are judged and measured in economic terms: return on investment and capital assets. But within the company, our success depends on our skill with human beings: building and developing the consistent knowledge base of our enterprise" (pp.17-21). De Geus (2002) continues, "In the years ahead, as developing countries expand their standards of living, corporations will be more needed than ever." He explains commercial corporations have only been

around a short time – 500 years – in comparison to the existence of human civilization. While they have been successful in terms of producing wealth, de Geus declares most commercial corporations are dramatic failures in light of their potential. “The average life expectancy of a multinational corporation – Fortune 500 or equivalent – is between 40 and 50 years... Human beings have learned to survive, on average, for 75 years or more, but there are very few companies that are that old and flourishing” (p.1). De Geus believes the “sharp difference between [the] two definitions – the economic company definition and the learning company definition – lies at the core of the crisis managers face today. The tension between them is almost certainly one of the key reasons behind the surprisingly low average life expectancy of companies in the northern hemisphere” (p. 21). The brain of an individual human being can more easily perceive, adapt to, and actively engage with its environment than a corporation can, so de Geus suggests leaders need to take specific action to help companies improve their powers of perception and change to match the outside world before situations become crises.

Do you agree or disagree with the concepts of the “economic company” and the “learning company” and does there need to be a new way of thinking about how companies measure success? Please BRIEFLY explain

Of the responses provided by the expert panel, the following EXPLICITLY stated if they Agree or Disagree with the above concepts?		
Agree	Neutral	Disagree
93.75%	6.25%	0
90.5%	4.8%	4.8%

The following categories also emerged from the responses provided. Only the categories most frequently suggested are included below. Of the responses provided, the following percentages of panel members EXPLICITLY stated...		
Yes, we need to think and/or measure success differently.	31.3%	23.8%
Agree with the concepts above but the economic measurement will or should not change.	18.8%	23.8%
Agree with the concepts but it's more about the rules or what is reinforced in companies and not because there is tension between 'economic' and 'learning.'	18.8%	14.3%
Agree with the concepts above but Oracle already survives unlike some other companies.	12.5%	14.3%
Yes, we need to think and/or measure success differently BUT it's a balance between 'economic' and 'learning' measurements.	6.3%	9.5%

Example quotes from panel members about the 'economic company' and the 'learning company' include:

I do agree - and yes - we need to think in a different way. We cannot only measure our success based on financial numbers. Human Resources, environmental behaviour (more and more in focus these days) and knowledge are more and more important and we all have to focus on that in the years to come.

I agree with the concepts. I believe companies and therefore leaders do little to enable the learning company. The focus on short-term results, reactive decision making, and the expectation that non-technical skills must be part of the employee's resume before they join our company really limits the learning company concept. When results are tightly managed from the top, employees and the company do not learn together.

I agree. We should find new ways to measure a company's success. Setting Up KPI (key performance indicators) for Human Capital is as important as measuring economic short-term success.

Agree with the 'learning company' concept. The needs of customers, market and economy change quite frequently and hence only organizations who can quickly learn, adapt and change will survive. An organization's overall 'nimbleness' is a good measure of success in today's environment.

I think the next generation of workforce will have greater access to information, is more mobile and wants to exercise more options in career planning. Hence, it is definitely critical for continued growth that intellectual property and a knowledge base be built and developed. But if a company is not economically viable...then it will not be in existence at all. So it is a balance.

I agree to some extent with the distinction between economic and learning companies. However, I don't think that one excludes the other. Indeed, I believe the economic company-side is necessary immediately to fund and facilitate the learning company, which is the long-term strategic guarantor of the company's future. Reflecting the short term tactical and long term strategic distinction I've made, I do think that we need to start to measure success in both ways - the tactical economic short term and the longer term transformational learning.

I agree. Our strongest assets, especially in the software business, are our people. This is knowledge work. We succeed based on our skills at attracting, growing, and retaining the best human talent. Growing includes training that helps people to change with the times and helps them focus on what is important in today's world, not what was important in yesterday's world. The longevity of organizations is directly based on their ability to adapt to change. And to do it early, and where possible to set the direction of change, not just to react. Sometimes it's too late to react. That is why Oracle has been around for 30 years. Usually a step ahead and setting direction, not just following.

There is only one measure at the end of the day for company success and that is the long-term earnings that it provides to the shareholders. The sources of these earnings can be capital, asset, or knowledge intensive, which is an advanced categorization of labor. At the end of the day, knowledge is created by people in an environment that nurtures such knowledge creation and captured over a period of time within the organization. Any organization cannot survive a massive walkout of knowledge

workers and cannot replenish their inventory of them and make them sellable assets easily. Therefore, people management becomes an essential skill in a knowledge organization. This knowledge expands beyond the boundaries of the organization and complements who can add their own flavor. Sometimes, just knowing who to partner with in which space and why to partner with them is enough to create wealth. One of the strengths of Oracle that is not observed in some of the acquired companies is the willingness of Oracle people to share their knowledge and teach others. There is no fear of job loss or anything.

I agree. As we continue to move into a knowledge based economy where all of the good employment is in services and all of the lower level, (labor, manufacturing), work is quickly moved overseas, corporations need to embrace and reward good ideas, innovation, and strategic thinking. In Sales, however, the ultimate measurement will always be results based. You may need to foster the learning company environment to achieve success, but, in the end, only results count.

I agree with the concepts as cited, however, I do not necessarily agree that there needs to be a new way of thinking about how companies measure success. In the end, those companies that push themselves to the limit of their potential will wind up dominating, and in turn, showing other companies that they'll need to do the same to keep up. In this way, the bar of success will be raised, but not necessarily redefined.

I emphatically agree with deGeus, companies that endure are those that learn, adapt and lead. I don't know that a re-definition of corporate success is required or practical - the P&L will continue to rule - but it is vital that employee success be defined, in part, by his or her ability to understand (learn) & adapt to their operating environment.

Our current measurement of success is and should be shareholder value - we are accountable to those who own the company and have invested their capital. As for a learning company, I agree that this is the path to success - the most successful ones are those who continue to adapt and evolve over time

I agree with the need for companies to change but not with the arguments above...people execute to how they are measured...CEOs are no different and forced to focus on short term. The result comes at the cost of optimal long-term decision making and the success of the corporation. We have examples every day at Oracle...this is why private equity is attractive for many leaders and why successful leaders are shy about returning to manage corporations...the environment forces them to make wrong decisions. This is different than the theory above (but I am all for theory).

Don't know if I agree or disagree. Interesting that it comes from a guy that has been living on a natural resource (oil) and the distribution of it... It's all down to the rules of the game, it's like a football team that plays the game well but does not win anything... If you 'win' by economic success it will never change.

I agree with de Geus' concept in general - that is there is an impedance mismatch between the economic goals of the company and cognitive nature of the individuals - but it is not the tension between the 2 things, but rather the inability of companies to harness the power of cognitive thinking of individuals to align with the economic goals that is important.

Yes, I agree with this concept. The one point though is that individuals can adapt and actively engage but that is just the point. Individuals are not corporations where we are talking about a multitude of individuals. It is when each individual will not listen or believes that his/her direction is the only one that corporations run into trouble. This relates to working better as teams and communication.

Disagree. Longevity does not equal success. In a rapidly changing world, corporate evolution may necessitate 'creative destruction', with new companies, business models, products and services emerging that cannot be accommodated by existing companies and structures.

6. Over the course of Rounds 1 and 2, the majority of expert panel members suggested and ranked the following 'Learning' approaches as essential and very essential.

Essential Learning approaches or worldviews

- Actively learn from others by asking key questions, seeking multiple perspectives, or problem solving together
- Be open to new ideas and learning new things - view every problem as an opportunity
- Learn (in general) from each interaction with people (team members, boss, and/or peers)
- Learn (in general) from each experience, challenge, and the environment itself
- Actively learn by doing and from willingness to possibly making mistakes
- Be willing to be out of comfort zone when taking action and learn from mistakes

How often do leaders you observe in your organization practice the above approaches to learning?

Panel members responded they observe the preceding 'learning' approaches...	% of Responses from the Consistent Group	% of Responses from the Additional Group	% of Responses from the Comprehensive Group
Consistently	11.8%	0%	8.7%
Moderately	47.1%	66.7%	52.2%
Sometimes but not often enough	35.3%	33.3%	34.8%
Not at all	5.9%	0%	4.3%

7. Over the course of Rounds 1 and 2, the majority of expert panel members suggested and ranked the following 'Communications' approaches as essential and very essential.

Essential Communication approaches or worldviews

- Encourage dialogue, ask questions, and effectively listen to cultivate trust and involvement
- Focus on high clarity and consistent messages to give clear direction
- Personally deliver and actively seek honest feedback
- Be open and transparent (and somewhat informal approach)
- Have personal humility & view employees at every level as equal and valuable
- Realize importance of being reachable & maintaining relationships (internally and/or with clients)

How often do leaders you observe in your organization practice the above approaches to communications?

Panel members responded they observe the preceding 'communications' approaches...	% of Responses from the Consistent Group	% of Responses from the Additional Group	% of Responses from the Comprehensive Group
Consistently	11.8%	0%	8.7%
Moderately	23.5%	50%	30.4%
Sometimes but not often enough	64.7%	50%	60.9%
Not at all	0%	0%	0%

8. How helpful do you think it would be to a team's overall effectiveness to EXPLICITLY discuss, encourage or reward the above learning and communications approaches as the operating norms?

Panel members responded how being 'explicit' would help a team's effectiveness...	% of Responses from the Consistent Group	% of Responses from the Additional Group	% of Responses from the Comprehensive Group
It would be VERY helpful	82.4%	83.3%	82.6%
It would be SOMEWHAT helpful	11.8%	0%	8.7%
It would be LITTLE TO NO help	5.9%	16.7%	8.7%
Uncertain if it would make a difference	0%	0%	0%

9. "The human mind is a particularly interesting device that displays remarkable adaptiveness and intelligence" (Anderson, 2000, p. 2). Few would dispute this claim that is strongly supported by cognitive science research; yet it is curious why so many people resist or have difficulty embracing change. Wheatley (1999) asserts that people tend not to "work with the forces of change. We act quite the opposite; we need to manage change and keep it under control every cautious step of the way. And we think we're being helpful to others when we manage change so carefully, because we believe that people don't like change. Strangely, we assert that it's a particular characteristic of the human species to resist change... even though we're surrounded by tens of millions of other species that demonstrate wonderful capacities to grow, adapt, and change" (p. 138).

In general, do you observe adaptive behaviors in your organization (YES or NO) and why do you think people either embrace or resist change? Please BRIEFLY explain.

Of the responses provided by the expert panel, the following EXPLICITLY stated if they observe adaptive behaviors in their organizations.

Yes	Mostly Yes	Some	No
53.5%	13.3%	6.7%	26.7%
55%	15%	10%	20%

The following categories also emerged from the responses provided. The categories most frequently suggested are included below. Of the responses provided, the following percentages of panel members EXPLICITLY stated...

People resist change because they feel out of their comfort zone and are uncertain about what to expect, so most prefer to stay with what they know which is less fearful	26.7%	30%
People resist change because they do not understand why the change is happening so clear and consistent communications about the reasons and benefits of the changes are important	26.7%	25%
People resist change because it is a risk and they want to protect their power or sphere of control and might be uncertain about what the change means for their role.	13.3%	15%
People resist change if they have not been conditioned during their youth or development years to embrace it or take initiative	13.3%	10%
People embrace change if they view change as a learning opportunity and are typically optimistic, enthusiastic, and ambitious	13.3%	10%
People resist change because they are not involved in the decision making and may not feel they are valued or their opinion is heard	6.7%	10%

Example quotes from panel members about why people resist or embrace change include:

Yes, I see adaptive behaviors; resistance is most common in situation where the 'change' hasn't been communicated correctly (reasons behind a change). It is essential for changes, that communication before, under and after the changes is effective (reach out to everyone with clear messages) and consistent.

No, I do not see many adaptive behaviors. The issue I see most often is that we spend very little time, effort money etc. on creating dialogue around the REASON for change. We don't allow employees to understand how the change will benefit them. We instead introduce change by communicating the change process, step 1 will be completed by this date, step 2 by...etc. When animals learn and adapt it is to better their life, i.e. more food, more security, species proliferation, etc. We face change more often than not with no understanding or acceptance of the personal benefits of the change. In an organization with little trust, this will result in major resistance.

Overall, I would say yes. I now see adaptive behavior overall in my organization which was not seen 5 years ago. This is in part due to the many changes that have already occurred in the organization. I also believe it is that the vision and messages related to the direction we are moving have been consistent for many years and therefore people understand what needs to be done. You will always have some that do not want to change which is human nature. Doing something new is always hard.
<i>Yes, I see adaptive behaviors. In my observations, people are not resistant to change, but are distracted by all of the discussions/rumours about pending change. At Oracle, people are immune to the state that 'change happens each fiscal year' and have prepared for it. The un-nerving part is the accompanying rumour and discussions.</i>
Yes, I observe adaptive behaviors, but not as much as I would like to see. People in general don't like change because it leads to uncertainty, and they are afraid of that. One of the major challenges for leaders is to help people navigate through uncertainty
Yes. People are resistant to change, because change means that something they know ends and the future may look uncertain. This happens mainly in cases when change is dictated. People embrace change when they are involved, understand the reason for the change, and can contribute to the change.
In general, No. People do not like changes, as it may imply not working in a comfort zone. Having said that, people all realize that changes are inevitable, the question is HOW fast and effective organization internalizes change and embrace change.
We know what we have, but not what we get... Most people seem to think that change will make life worse. It's also like travel where you should not stop. It's hard work to start the travel again, but if you are traveling all the time, it's very interesting and exciting.
<i>There are some adaptive behaviours, but in general I think humans are averse to change as a first reaction. When forced into it, many times, they emerge on the other side better for it. But it's not something that many seek. The 'comfort zone' of continuing to do what you always do, is easy. Change can be difficult and forces you to go on faith as to what can be on the other side. Where you are now is known, where you could be with change is unknown. Unknowing causes doubt and fear. And hence most people prefer to stay with what they know.</i>
Yes, we do observe adaptive behavior in our organization. Many people resist change: 1. Natural human behavior, 2. People get into a comfort zone and do not like to disturb this comfort zone, 3. Fear of unknown, 4. Tendency to protect their power or sphere of control. Most of the people who resist change or those who have gained certain powers with that organization and view any change as a threat to their power and control. However, certain sections of the people do embrace change because they constantly want to learn, explore new opportunities, and believe that change is way to gain new power or control.
<i>I do observe adaptive behaviour in my organization, though not consistently. I think people resist change for a variety of different reasons; for some, change brings risk that they will lose some responsibility; for others, change mean that they will be less effective in the short term (and if they're very focused on near term deliverables, change is a very real threat to them).</i>
Many people in Oracle are adaptive - they have been employees for many years and are used to change. Individuals, who can think through change and identify a new or

enhanced role for themselves, embrace change. For those who will be disadvantaged, or who can not see that benefits outweigh risk, it may be better to resist change - my view is that the non-changers are a minority in Oracle
Our organization is capable of going through massive change. Our US leaders in specific do not drive change by getting buy in but rather by giving instructions. Many times, they ignore major factors, but rather than provide some flexibility to the field to fix it, they try to make it very tight. One size fits all without an 80/20 rule is sometimes what wastes our time and effort, forcing management to go down to every small detail because they have no flexibility to make alterations while keeping the spirit of the change. The issue is that most people are not involved in the decision making process, so there is no commitment to the decision. A balance is required. If people feel that their opinion is heard before the change is made, they will be more likely to support the change. On the other hand, if the leader is going to wait until all opinions are heard, the change will take forever. So, it is more opinion seeking and faster implementation or less opinion seeking and slower implementation. At present, in Oracle, it is faster decision making and no opinion seeking or buy in.
<i>Generally, yes, I see ongoing adaptive behaviors in response to market conditions, customer preferences and employee behavior. I find change is often desired at higher levels of management and less desired on the front lines where employees tend to feel more expendable/less valued.</i>
Yes. I think the ability to deal with Change has to be trained from youth. Most parents are protective and that does not help their children to embrace change.
No. For me, much is cultural. Almost all of the countries that I manage have had a history of communist rule or substantial communist influence. This has stifled personal initiative and taught people not to extend/expose themselves - to 'manage' their situation within boundaries that they can control. This is lessening as we move further from the communist era. In these countries so much is done by personal influence. In order to change, you have to break down the networks of influence that have been built over many years.
In general, yes, but not in all employees. The ones that resist 'transformation', as we call it, ultimately fail and end up being moved out of the organization. We actively encourage embracing change. More importantly, we monitor whether or not the individuals are implementing it. Nothing endures but change.

10. How do you describe your purpose for leading? In other words, what gives you meaning and gets you out of bed in the morning? Why do you desire to lead? Please BRIEFLY explain.

Of the responses provided by the expert panel, the 'purposes' seemed to generally express either a focus on "others" or a focus on the "goal" itself.		
Others	Goal	Goal & Others
50%	31.3%	18.8%
52.4%	28.6%	19%

Note: It is possible and likely that an individual's 'purpose for leading' is equally motivated by a combined focus on others and the actual goals. Certainly, the two are interconnected. Yet, for the purposes of this study, only what was explicitly written was considered and the greater tendency was identified.

Quotes from panel members about their desire or purpose for leading...
I like to see an organisation work well together. I like to work with a strong and dynamic team that is willing to go the 'extra mile' - and I do like to lead people and a business and to reach results (business and human).
I like building things that work. I hope that people will enjoy being part of what we have all built together, and enjoy its success. I learn from what I have done and believe that it is building my future.
I see my role as a leader in many different ways; I am a steward, a teacher, a coach, a manager, and a team member. This diversity is my motivator as it is all focused on helping the organization grow and improve.
My purpose is to lead teams to achieve common goals, as there is no single hero. Today's environment requires teams to work together. My purpose is to ensure team alignment, fair rewards and recognitions. If we can do this, the power is amazing; we can make the impossible possible. That is job satisfaction.
I am not sure a true leader has a desire to lead. I think it's people that are so eager to get to the goal, that they either convince people to join them or they just keep doing their thing and people just follow them. So I get out of bed to reach the goal I have set.
I think it has to start with a desire and a belief that I can make a difference to the company. Then a belief that I can lead the team to make that difference.
I like success and fun with big teams and helping people grow and develop.
I have always been a very goal oriented individual with a strong desire for success. I love the action. I relish the fact that in our profession, we are always under scrutiny and must achieve very quantifiable results and do so every 90 days. It's not for everybody! I like to teach and mentor. It is very gratifying to see young leaders take what I have given them, put it into practice, adding their own expertise and ultimately becoming successful and leading larger and larger organizations.
When I believe in a vision, I am passionate about making a contribution to develop the strategy, lead a team and help execute the vision. I am excited at leading a team and being able to achieve exceptional results. I like to help people get there most, unleash their potential and upgrade the team. I love being able to develop a growing and learning environment; I strongly believe it leads to success, happiness, and health.
It is good to make a difference - that is to have some impact (hopefully positive) from your actions. Leadership is a great way to have a leveraged impact - which provides an even greater sense of satisfaction.
I want to transform my organization from a relatively reactive, isolated, and offshore focused organization to a world class, nimble and truly global organization. I want to make a significant, positive difference with my organization; otherwise, my leadership does not make sense. I do have a very talented team of people, open for the transformation but more inclined for directions than driving it themselves. So I need to build a strong leadership team in group, who can lead the transformation in the future.

These are the things that make me get out of bed and lead my organization every day.
I enjoy seeing people grow and accomplishing our goals. It is always nice to be able to celebrate successes.
I get out of bed because I have to be successful in everything I do. I have to become better everyday and I enjoy doing it. Failure for me is no option, but even if I fail, I will at least spare no energy to succeed. There are 1000 families that feed their kids based on our team's success, thousands of customers that entrusted us to run their entire business, and I will do all that it takes to make them all successful.
I enjoy the challenge of problem solving and in completing work. I also believe that at some point I can optimize my work vs. my management team and not have to work so hard.
I am totally aligned when I lead. I have a passion for growth, learning, and expansion and thoroughly enjoy helping others experience these great opportunities as well.
A combination of the following: 1) Fear of failure (which is remarkable given my success but it still keeps me awake!) and the desire to be successful (and ultimately a CEO of a large corporation or my own corporation), 2) My purpose for leading is to 'serve'... I read a little book once called 'servant leadership' (about a retreat at a monks ministry) and it changed my views on leadership forever.
<i>My purpose for leading is simple: I feel I can make a difference in enhancing our customers experience and improving the lives of our employees. I have a strong motivation to create an environment where employees feel successful and can be proud of the organization in which they work. I also feel strongly that our customers look to our organization as a leader in its field.</i>
<i>Making a positive difference to my team, my organization and Oracle. I believe by learning from others and using that to lead my team moves me towards that goal. I believe in human potential, and that if tapped and guided correctly, we can achieve great things.</i>
<i>I like being empowered to make decisions that make a real difference to the success of Oracle. I enjoy immensely striving to optimise a complex organism of >500 people; I love getting people excited about, and aligned to, an objective - then letting them grow as they over-deliver on that objective.</i>
<i>I believe I make a difference. Believe I add value to the people who work with me as a result of my perspectives, beliefs and goals.</i>
<i>I work FOR the people in my organization. The purpose of my title and office is to help them be successful. My role is to break down barriers and 'move mountains' so my team can succeed.</i>

11. OPTIONAL LAST QUESTION – Please feel free to comment here on anything else you would like to say related to the topics discussed in this study.

“Being an admired leader is a difficult job. It takes a lot of commitment and sleepless nights. It is a responsibility towards oneself not to fail those who trusted them with something. It is a respectful look in the mirror with a sense of pride and humbleness at the same time and a willingness to fight for what one believe is right even if it seems unreasonable. It is a

reputation that one earns and in a way a selfish need to be respected for what one achieves. It can be tough. It takes time. As they say, 'It takes a rough sea to make a good captain.'"

"This is in itself a great learning opportunity. A leadership series where managers have the opportunity to think and to have dialogue at this level would be very rewarding for our leadership individuals and teams."

**Several panel members expressed an interest in such a virtual leadership forum.

APPENDIX M

BACKGROUND QUESTIONNAIRE

Appendix M

Background Questionnaire

This short questionnaire is designed to collect basic demographic background information on the expert leadership panel. Thank you kindly.

1. How many total, cumulative years of experience do you have working in the corporate world?
2. How many total years have you worked for Oracle?
3. How many total years have you served in a FORMAL leadership position (include any level of management at all places of employment)?
4. How many years have you been in your current position?
5. Approximately how many people (overall organization) do you manage?
6. Please indicate your gender. ☐ Male ☐ Female
7. How would you describe (or identify) your nationality/ethnicity?
8. Are you willing to be identified as one of the expert panel participants in this study? If so, your name will be shared with other expert panel members upon completion of the study. However, all responses will be kept ANONYMOUS and names will not be linked to responses. ☐ Yes ☐ No
9. Please type your name if you wish to be identified in association with participation in this study:
10. Would you be interested to participate in possible future discussions related to topics discussed in this exploratory study? ☐ Yes ☐ No ☐ Possibly

APPENDIX N

**BACKGROUND QUESTIONNAIRE: COMPILED
RESULTS**

Appendix N

Background Questionnaire: Compiled Results

NOTE – Font indicates the following:

Regular font – Results from panel members in the Consistent Group, n=18

Italics font – Results from panel members in the Additional Group, n=8

Bold font – Results from the Comprehensive Group (Entire Panel), n=26

The 26 Expert Panel Members reported the following information.

Years of Experience:

	Average Years of Consistent Group	Average Years of <i>Additional Group</i>	Average Years of Comprehensive Group
Total, cumulative years of experience working in the corporate world	24 years	<i>19.5 years</i>	22.7 years (overall range from 32 years to 12.5 years)
Total years worked for Oracle	10 years	<i>9.7 years</i>	10.1 years (overall range from 19 years to 1 year)
Total years served in a FORMAL leadership position (including any level of management at <u>all</u> places of employment)	17 years	<i>12.8 years</i>	15.5 years (overall range 26 years to 6 years)
Years in CURRENT leadership position at Oracle	3 years	<i>1.8 years</i>	2.6 years (overall range from 6 years to 6 months)

Organization Size:

	Average Size of Organization (Consistent Group)	Average Size of <i>Organization (Additional Group)</i>	Average Size of Organization (Comprehensive Group)
Total number of employees you manage (size of overall organization)	669 employees	<i>358 employees</i>	573 employees (overall range from 2600 to 25 employees)

Gender:

	Gender of panel members (Consistent Group)	Gender of panel members (Additional Group)	Gender of panel members (Comprehensive Group)
Number of Male participants	15	5	20*
Number of Female participants	3	3	6*

**** In comparison to corporate reported demographic data (as of Dec. 1, 2006)...**

- There are 819 executives (M6 level and above) in Oracle's overall worldwide population.
- 77% of the panel participants were males as compared to **81%** of the worldwide executive (M6 and above) population in Oracle.
- **23%** of the panel participants were females as compared to **19%** of the worldwide executive (M6 and above) population in Oracle.

Demographics for Employees with Career Level M6 and Above

Gender by Region

REGION	Female		Male		TOTAL EMPS
	# Emps	% Total Emps in the Region	# Emps	% Total Emps in the Region	
APAC	9	13%	61	87%	70
CANADA	1	11%	8	89%	9
EMEA	18	12%	131	88%	149
INDIA	0	0%	8	100%	8
LAD	2	15%	11	85%	13
US	122	21%	448	79%	570
TOTAL	152	19%	667	81%	819

Office locations were reported on the initial consent form as follows:

- **In total, 12 different countries were represented on this expert panel.**
 - **In total, 20 different cities were represented on this expert panel.**
- Argentina - Buenos Aires
 - Australia – Sydney
 - Brazil - Rio de Janeiro
 - China – Beijing (1 'consistent' participant *and 1 'additional' participant located here*)

- Denmark
- Germany – Munich
- India
 - Bangalore
 - *Gurgaon*
- Singapore
- Sweden – Jonkoping
- United Arab Emirates – Dubai
- United Kingdom – Reading (1 ‘consistent’ participant *and 2 ‘additional’ participants located here*)
- United States
 - *Bellevue (Washington)*
 - *Chicago*
 - Colorado Springs
 - Houston
 - Miami
 - Reston (Virginia)
 - San Diego
 - San Francisco (HQ) – (2 ‘consistent’ participants *and 2 ‘additional’ participants located here*)

Self-described Nationality or Ethnicity:

Participant self-descriptions of national or ethnic identity varied. Based on participant descriptions, the expert panel was diverse. (The researcher was careful not to make inferences or group the descriptions, so the information is being listed as reported by panel members.)

The 26 panel members described their nationality or ethnicity as follows:

American (description from 2 participants)
 Argentine
Asian Indian
 Brazilian
 British (description from 1 ‘consistent’ participant *and 1 ‘additional’ participant*)
Canadian / Caucasian
 Caucasian (description from 2 ‘consistent’ participant *and 2 ‘additional’ participants*)
 Chinese (description from 1 ‘consistent’ participant *and 1 ‘additional’ participant*)
 Danish
 European
 Indian (description from 1 ‘consistent’ participant *and 1 ‘additional’ participant*)

Irish
 Middle Eastern
 North American Caucasian (description from 2 participants)
 Singapore / Chinese
 South Asian
 Swedish
US Citizen, born and raised in India

In addition, Organization (Line of Business) and Regional information was compared to overall corporate data (as of October 11, 2006):

Organizations

Organizations	% of overall employee population	% of panel members (Consistent Group)	% of panel members (Comprehensive Group)
Catz (primarily F & A)	8%	11%	7.7%
Phillips (primarily Sales, Consulting, Marketing)	46%	56%	50%
Rottler (primarily Support Services)	21%	22%	23%
Rozwat (primarily Core Technology/Database)	10%	11%	11.5%
Wookey (primarily Applications Development)	14%	0%	7.7%
Screven	1%	-	-

Regional Representation

Region	% of overall employee population	% of panel members (Consistent Group)	% of panel members (Comprehensive Group)
Asia Pacific	28.05%	22.2%	23%
Europe & Middle East	25.92%	27.8%	26.9%
Latin America	3.02%	16.7%	11.5%
North America	43.01%	33.3%	38.5%

Following is a partial list of the Expert Panel Members (in alphabetical order) involved in this study:

- 23 panel members were interested in being associated with this study
- 3 panel members preferred to not be identified

- Anders Ottosson
- Cheryl McDowell
- Clare Dolan
- *Clive Swan*
- *Gopi Tummala*
- Harry Storer
- Henrik Wegge-Berg
- Hugo E. Freytes
- Husam Dajani
- James Fitzgerald
- *Jim Kowalski*
- Jim Patrice
- John Gawkowski
- Luiz Meisler
- Martin Woodcock
- *Preeti Somal*
- *Rob Green*
- Roger Li
- Rolf Schwirz
- *Sue Scates*
- Ted Bereswill

- Vivek Marla
- Wee Peck Hoon

Finally, several panel members wrote the researcher directly to indicate they enjoyed being involved in this study and would be interested in future executive communities. In addition, specifically on the questionnaire...

- 19 executives said 'yes' they would be interested in future discussions related to the leadership and complexity topics explored
- 5 executives said 'possibly' they would be interested in future discussions related to the leadership and complexity topics explored
- 1 executive said 'no' they would not be interested in future discussions related to the leadership and complexity topics explored.