Implementing Innovation with Ambidextrous Leadership in Small and Medium Enterprises.

Deborah L. Pearce
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Implementing Innovation with Ambidextrous Leadership in Small and Medium Enterprises.

Abstract
Implementation was an overlooked aspect, with a paucity of research until the 1990s. Although scholarly and practical research grew, the preponderance focused on large established organizations. Only more recently have small and medium enterprises (SMEs) received attention. Yet, economic vitality depends on SME success. The study investigated innovation implementation in SMEs. Focus was on ambidextrous leaderships, senior leaders’ efforts to advance their organizations by ensuring capabilities for both current and future innovations. The study identified how senior leaders’ individual orientations motivated innovation and its implementation. Using a concurrent embedded mixed method design (Creswell, 2009), quantitative data was collected using a proven instrument (ISPI™) to inform qualitative one-on-one interviews. A simplified, modified Delphi approach with area experts aided in purposeful company selection. Research explored perspectives of two senior leaders in each of seven companies, headquartered in the Rochester, NY and Charlotte, NC areas. Follow-up calls for clarification and interview summaries for member checking provided increased credibility. Findings identified clear evidence of ambidexterity in SMEs but in an emerging form rather than that prescribed for large established businesses. Seven themes revealed leaders’ efforts to build capabilities for current and future innovations. Three meta-inferences were found. Results enriched understanding of innovation in SMEs, particularly of senior leaders seeking to create enduring organizations.

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Implementing Innovation with Ambidextrous Leadership in Small and Medium Enterprises

By
Deborah L. Pearce

Submitted in partial fulfillment of the requirements for the degree Ed.D. in Executive Leadership

Supervised by
Dr. Mary Collins

Committee Member
Dr. Timothy Madigan

Ralph C. Wilson, Jr. School of Education
St. John Fisher College
December 2013
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Deborah L. Pearce
December 2013
Dedication

First and foremost, dedication goes to my family. This dissertation journey expanded the already numerous roles my husband, Dr. William J. Sheeran, plays in my life personally and professionally, including co-founder of our consulting firm LeaJames, Inc. In my first course paper, he was my “conceptual conversation partner” when I initially claimed innovation implementation to be my area of research. Later he provided both spark and clarity in locating the topic. In a final stage, he was an invaluable “expert in conceptual analysis” as we worked side by side with hundreds of Post-It® Notes, transforming codes into evaluations and themes. Throughout the thirty-month journey of my doctoral work, he continually linked my research to reality. More critically, he constantly kept me grounded in our family while holding me true to my destination. Our daughter, Suzannah Lea Qi Sheeran (“Leaz”) was at first a reluctant participant in “Mom’s new endeavor,” but became a leader in assuring focus on and celebration of the milestones along the way. She rallied her middle-school community in support of a “strong finish.” She consistently shared her essence of zeal, what I treasure as “light of mine.”

Sincere gratitude goes to many others who also played instrumental and encouraging roles. The dissertation experience in the Doctorate of Executive Leadership Program (DEXL) at St. John Fisher College (SJFC) is unique and highly personal. My committee was assigned early in the program when my topic, “innovation implementation,” was in its nascent stage and seemed as broad as “world peace.” My
committee chair Dr. Mary Collins (expert in nursing, leadership and higher-education) and committee member Dr. Timothy Madigan (expert in philosophy and Director of the Irish Studies Program) might have appeared unlikely for this doctoral candidate (business person, trained as an engineer and MBA). Yet, we found great mutuality in our kindred-pioneering spirits. Meeting after meeting, they would guide, encourage, and challenge as I focused the topic and navigated the journey. Occasionally, they would create a pause to draw notice of an essential element breaking over a horizon. At all times, they energized me with their belief in my endeavor, never faltering at the complexity. They had faith that insights would flow forth at the right time. They also knew when to pivot to “get ‘er done” and shift abundant curiosity into future exploration opportunities. They provided an environment and a pathway for transference of inspiration.

The DEXL program provided an enriching setting and a trustworthy process. The cohort model was a powerful mechanism for the accelerated nature of the program and the mutual learning it afforded. My Team Transformers, was a bedrock of strength and a rocket of creativity. Thank you Drs. Karen Bobak, Josh Fegley, and Seanelle Tracy. Dr. Carly LeBlanc became a trusted “critical friend.” Doctoral candidate Isabel Jones became my library-mate and friend. Dr. Phil Uncapher was always ready to listen and advise.

The scholarly process can be a daunting one for a seasoned practitioner. Key people and resources made the doctoral research world accessible. Betsy Christiansen is central to the DEXL program in navigating the process, accessing needed assistance, and ensuring research studies meet rigorous scholarly standards. The extraordinary research team at SJFC’s Lavery Library guided me, as if through a “special looking glass,” into the infinite world of publications. Support from the Office of Information Technology
was especially helpful including Robin Schmid, Eugene Lazurenko, and the talented students and staff on help desks.

Sincere appreciation goes to many others who graciously supported my research efforts, including: Dr. Steve Diamond, Richard Glaser, David Horth, Mark Peterson, Dr. Nabil Nasr, Jim Senall, Johnathan Vehar, Paul Wetenhall, and Dr. Mark Zupan. The senior leader participants, who remain anonymous unless they later choose to become known, are held in my deepest esteem and with sincere gratitude. By sharing their stories and revealing their preferences, they gave life to my research.
Biographical Sketch

Deborah L. Pearce is CEO of LeaJames, Inc., a general management consulting firm. She serves on the Boards of Rochester School for the Deaf, The Harley School, Quad A for Kids, and Harvard alumni clubs. Her professional experience includes executive and leadership positions at United Technologies, General Electric, The MAC Group, and IBM. She has been a guest speaker and lecturer at Syracuse University and Rochester Institute of Technology.

Her higher education began with a Bachelor of Science in Applied Math with a Minor in Computer science from the University of Virginia’s School of Engineering and Applied Science and continued with a Master in Business Administration from the Harvard School of Business. In the summer of 2011, she began her doctoral studies in the Doctorate in Executive Leadership program at St. John Fisher College in Rochester, NY. Ms. Pearce conducted a research study in the area of innovation implementation under the guidance of Drs. Mary S. Collins and Timothy J. Madigan, receiving an Ed.D. in Executive Leadership in December 2013.
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This research was supported by a generous grant from Innovation Connection Systems, Inc. (ICS) and the support of its fine team. I met founder and CEO, Bob Rosenfeld, when searching for leading-edge issues related to innovation implementation. He embraced my quest and opened his schedule. As a proven pioneer and guide to others, he recognized possibilities still unformed. His theories became foundational and the ISPI™ instrument central to this research study. Bob enriched my thinking with our many discussions and enabled my journey. Many people at ICS offered vital support. Especially noteworthy was Ryan Ewers, ICS statistician and ISPI™ product manager, who shared his expertise and offered incisive insights.

Permission to use H. Igor Ansoff’s Grow Vector Matrix was kindly provided by Peter Ansoff on behalf of the Ansoff Family Trust. In seeking permission, I had the opportunity to connect with sons Fredrick and Peter. I learned more about a key figure in the history of business, specifically business strategy. The task of “good research” became an occasion of inspiration.
Abstract

Innovation efforts in business have been intensifying, but with poor success rates. Implementation was an overlooked aspect, with a paucity of research until the 1990s. Although scholarly and practical research grew, the preponderance focused on large established organizations. Only more recently have small and medium enterprises (SMEs) received attention. Yet, economic vitality depends on SME success. The study investigated innovation implementation in SMEs. Focus was on ambidextrous leaderships, senior leaders’ efforts to advance their organizations by ensuring capabilities for both current and future innovations. The study identified how senior leaders’ individual orientations motivated innovation and its implementation. Using a concurrent embedded mixed method design (Creswell, 2009), quantitative data was collected using a proven instrument (ISPI™) to inform qualitative one-on-one interviews. A simplified, modified Delphi approach with area experts aided in purposeful company selection. Research explored perspectives of two senior leaders in each of seven companies, headquartered in the Rochester, NY and Charlotte, NC areas. Follow-up calls for clarification and interview summaries for member checking provided increased credibility. Findings identified clear evidence of ambidexterity in SMEs but in an emerging form rather than that prescribed for large established businesses. Seven themes revealed leaders’ efforts to build capabilities for current and future innovations. Three meta-inferences were found. Results enriched understanding of innovation in SMEs, particularly of senior leaders seeking to create enduring organizations.
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Chapter 1: Introduction

The Importance and Urgency of Innovation

Innovation has gained “top billing” in business strategy and corporate communications for organizations large and small. Quarterly and annual reports for 2011 mentioned some form of the word 33,528 times, up 64% from five years prior (Kwoh, 2012). While some may have been “image building,” many businesses truly were seeking “renewal” and “change” – the meaning of the Latin noun *innovatus*, dating back to the 15th century (Kwoh, 2012).

The need for effective innovation today has heightened dramatically, driven by forces from multiple fronts. Fueled by information technology, the dynamics of the global competitive landscape has intensified (Friedman, 2006). India and China, in particular, are creating a multitude of new consumers, suppliers, partners and competitors; current players are excited about the new sales and supply possibilities but are also fearful of new competitors. New entities are disrupting existing players as they enter through the previously underserved, undesirable market segments (Christensen, 1997). “There is a widespread consensus that innovation is fast becoming the principal source of differentiation and competitive advantage in today’s knowledge-intensive economy” (Hill, Travaglini, Brandeau, & Stecker, 2010, p. 611). Yet, innovation is difficult and uncertain.

The methods of management that served in decades past are inadequate for today’s business challenges. To enable successful innovation, management practices
themselves must be sufficiently innovative. Koudal and Coleman (2005) summarized research studies on innovation failure rates, “More than 85 percent of new product ideas never make it to market. And of those that do, 50 percent to 70 percent fail” (p.21). Christensen and Raynor (2003) found “A surprising number of innovations fail not because of some technical flaw or because the market isn’t ready. They fail because responsibility to build these businesses is given to managers or organizations whose capabilities aren’t up to the task” (p. 177). These failures are more than opportunities lost to the organization; they represent scarce resources wasted on both financial and human capital fronts.

While innovation is critical for sustained competitive differentiation, worthwhile innovation efforts can generate more than a successful new product and increased profit performance. Innovation can be a critical piece to a larger corporate purpose. Kanter (2011) conducted fieldwork in twenty companies in four continents and found that in “great companies,” society and people were considered core to organizational purpose. While striving for profits, these companies used a different logic, “institutional logic,” to invest in the future and build “enduring institutions.” Among the six facets Kanter found present in “great companies” was innovation operating within an expanded context. One finding was “articulating a purpose broader than making money can open new sources for innovation” (p. 75). She observed companies that identified new innovation ideas by attending to social needs. Institution-building efforts “helped connect partners across an ecosystem, producing business model innovation” (p. 74). Cemex, for instance, created many product innovations to address social problems such as antibacterial concrete for hospitals. Its Construrama distribution program was formed to strengthen small hardware
stores in Latin America against the recent invasion of Lowes and Home Depot. Invited to participate at no charge were dealers with high ethical and service standards, including commitment to community service. Professionals in organizations like Cemex were operating with greater trust and self-determination to create and organize new ideas across formal structures. Ideas were connected with organizational capabilities and produced meaningful innovation.

Innovation does not equate to ideas alone. Govindarajan and Trimble (2009) of the Tuck School of Business at Dartmouth University found innovation is about commercializing ideas and what “people are missing is the organization part.” Even with the advantages of rich resources such as funds, technology, and talent, organizations face blind spots and traps. To expand an organization’s capability for innovation and growth, senior leaders must address a wide variety of strategic considerations and attend to the challenges and paradoxes inherent to innovation.

**Background of the Role of Innovation in Society**

**Creative destruction.** Innovation has a long history of driving the growth of economies while shattering the past. Joseph A. Schumpeter, a great 20th century economist of the “Austrian School” and later at Harvard University, made popular the paradoxical term “creative destruction.” Schumpeter first used this term in 1942 to portray how innovation continually displaces old products and methods and thereby disrupts entire industries and propels economies upward (McCraw, 2007). He challenged the thinking of classical economists from Adam Smith to John Maynard Keynes. He considered Adam Smith’s equilibrium state to be best seen as temporary, otherwise stagnation would result. He asserted that over time capitalist economies grow and he
worked to explain the process of change underlying this growth. He refuted the notion that “the age of innovation had passed and ‘mature’ capitalism was at hand” and held up “the element of personal initiative” (p. 456). Separating from Keynes’ view of macroeconomics, Schumpeter cast attention on the firm and the entrepreneur (Audretsch, 2008). At this level, innovation is initiated and the dynamic of creation and destruction is launched.

Schumpeter’s entrepreneur is the agent of innovation. Beyond profit alone, the entrepreneur is driven also by the “will to conquer,” seeks out difficulties and opportunities for change, and “delights in ventures” (McCraw, 2007, p. 500). Innovators, with a cost or quality advantage, intrude into established territory and begin “warring with an old sphere” (McCraw, 2007, p. 256). The higher profit from the new products and methods create motivation for other participants to replicate. A “swarm” force of disruption attracts investment, creates a boom and thereby strikes at the foundations of the existing firms (Leonard, 2009). These cycles propel the capitalistic economy with “gales of creative destruction”. The dynamic incessantly revolutionizes the economic structure from within by creating then destroying “along a very bumpy track.” Those companies overtaken by the innovation are injured, yet those able to renew through continuous technical innovation and organizational remodeling enjoy prosperity. Individuals benefit with better material lives and the economy is strengthened by growth. Schumpeter showed the positives of creation exceed the negatives of destruction for the overall economic system, with innovation benefitting multiple levels.

Strategic entrepreneurship. Building on Schumpeter’s emphasis on the positive value of the entrepreneur and creative destruction, Hitt, Ireland, Simon, and Trahms
(2011) studied the positive potential of “strategic entrepreneurship.” Strategic entrepreneurship combines the dynamic of individuals’ and organizations’ advantage-seeking and opportunity-seeking behaviors with potential beneficial outcomes for society. Entrepreneurs, in addition to increasing personal wealth, enhance their knowledge and achieve personal happiness. Similarly, organizations, while pursuing customer value and market differentiation, create knowledge, new technologies, and innovations. Growth and wealth create jobs and inject financial capital into the system. In this growth setting, “organizations created to engage in social entrepreneurship – and, more broadly, corporations engaging in socially responsible actions – serve a variety of stakeholders” (p. 68). Beyond Schumpeter’s promise of growth for the capitalist economy, wealth for the entrepreneur, and material goods for the masses, innovation also holds great potential of benefitting previously neglected constituents of society.

Gandhian innovation. Schumpeter, in the 20th century, considered innovation in terms of products and methods. In the 21st century, businesses are seeking additional innovation pathways such as new business models that break past constructs and open markets for serving unmet needs. Through in-depth study of Indian companies across a wide range of industries, Prahalad and Mashelkar (2010) captured the essence of novel approaches with the term “Gandhian innovation,” coined to draw on Gandhi’s touchstones of affordability and sustainability for the benefit of all. With an “unwavering focus on capital efficiency” (p. 140), companies revolutionized their markets by changing the business dynamics, synthesizing technologies, and creating new technologies. Philosophical underpinnings were a “deep commitment to serving the unserved” and a “focus on people, not just shareholder wealth and profits” (p. 140). To make way for
new mindsets and concentrate on creating new markets, companies abandoned traditional performance measures. For instance in India, Bharti Airtel realized that the cellular industry’s standard performance metric of average revenue per user (ARPU) would not suit its markets. Instead it adopted measures to foster market expansion across the full population and built a strategy for dramatically low prices (one cent per minute in contrast to six in Japan and eight in the United States). Business model innovations followed in the areas of sourcing partnerships, competitor collaboration, application development, and distribution and sales. The profit growth was especially remarkable given its telephone service became the most affordable telephone service anywhere and is available to hundreds of millions of people across India. Innovation continues to prove its potential for lifting “the masses,” going well beyond those of the Western economies described by Schumpeter decades ago.

**Problem Statement**

**Creative destruction on multiple levels.** Survival and growth are a “messy business.” Companies, like individuals, must define and later re-invent themselves. “Happily-ever-after” is a fairy tale in both personal and corporate contexts. Lest they fall victim to obsolescence or irrelevancy, both people and companies are increasingly called to renew themselves.

Much research, scholarly and practical, has been devoted to understanding the innovation conundrum for large established organizations, forming theories, and shaping methods for resolution. Considerably less attention has been dedicated to small and medium enterprises whose contexts and organizational development challenges differ significantly. Churchill and Lewis (1983) spoke out in their research for the unique
considerations necessary to understand and manage small businesses. The most common and critical need is achieving growth while maintaining vigilant management of cash flow (internal through current operations and external from lending and investment sources). With growth comes changing problems and skill needs across the management spectrum such as the quality and diversity of people, systems and processes, and the ability for the leaders to delegate decision making effectively. Growth is uneven and skills rarely match the changing problems immediately. Surviving to the next development stage can be problematic. Becoming an enduring organization is a journey, one that is critical to more than the business constituencies. Successful SMEs are crucial for the future of communities, industries, and the country.

Cities, medium-sized especially, also face the need for re-invention as their historical economic engines sputter or fail. Many are pinning their hopes on the promise of startup companies. Yet, to make sufficient impact, these companies must survive infancy and enter into growth to provide jobs and capital as well as consumer services. Cities need to create and nurture environmental munificence to increase the odds of success for SMEs. Moving from survival and into growth introduces an expansion of priorities and strains on the resources. “This shift in priorities places a firm in an interesting dilemma: existing customers must be kept satisfied while pressures to continue innovation must be addressed” (Schreuders & Legesse, 2012, p. 17). Lacking deep pockets and abundant capabilities, SMEs must seek external supports from their environments to achieve innovation in concurrent states of stability and dynamism.

The future depends on innovation but success is tough and the odds are low. Large established companies struggle to create “a new” that can co-exist with “the old.”
Small immature companies seek to gain a sufficiently stable foundation once their startup efforts have proven viability but the need to grow is ever pressing. The tensions call for ambidexterity within the organization. Senior leaders can embrace the tension by “leading ambidextrously” (Tushman, Smith, & Binns, 2011). The pressure is on senior leaders to embrace the tension despite the inherent paradox, provide guidance in seemingly conflicting modes, and expand the capabilities of their organizations.

**The significance of small and medium enterprises (SMEs).** Across the country, the most promising growth rates are coming from the medium enterprises (revenues between $10 million and $1 billion employees between 100 and 3,000). Medium enterprises have reached a third of United States’ gross domestic product and account for approximately 41,000,000 jobs. Growth of these businesses has become a “leading indicator of America’s future competitiveness” (smallbusiness.foxbusiness.com/entrepreneurs/2012/04/26/mid-size-companies-lead-way-in-growth-and-jobs). A recent survey of 1,000 chief executives by the National Center for the Middle Market (NCMM), a partnership between The Ohio State Fisher College of Business and GE Capital, revealed revenue growth this year with expectations of continued growth outpacing that of large business. Similarly, an earlier NCMM survey showed medium enterprises adding jobs at a higher rate. Makhija, NCMM Director, cited the research as “imperative to identifying the drivers and barriers of middle-market growth, so we can continue to support their contributions to the economy” (FoxBusiness, 2012).

In 2006, one-half of the private sector consisted of small businesses (fewer than 500 employees as defined by U.S. government) and one-half by large, each with
approximately sixty million employees. Brian Headd of the Office of Advocacy of the Small Business Administration conducted an analysis in 2010 and found the small business sector to be the setting for the largest job gains and losses. With the net job loss exceeding seven million (December 2007 to December 2009), Headd submitted “small and large firms have differing roles in the labor market” and showed “the major part of job generation and destruction takes place in the small firm sector, and small firms provide the greater share of net new jobs” (Headd, 2010, p.3).

SMEs provide innovation engines. In a study of patent activity across 1,293 U.S. companies from 2002 to 2006, small businesses (defined as companies with 500 and fewer employees) had a higher patent-to-employee ratio than large businesses (Breitzman & Hicks, 2008). In fact, companies with 25 or fewer employees had a greater ratio than those with fewer than 50, which in turn had a greater ratio than those with 100, and the decline continued as the company size break points increased. Small businesses’ patents themselves were deemed of higher impact using proven metrics for innovativeness of firms, labs, and agencies (i.e., growth, citation impact, patent originality, and patent generality). “This suggests that the patents of small firms in general are likely to be more technologically important than those of large firms” (Breitzman & Hicks, 2008, p. iii).

While the total patents made up only 6.5% of all patents, small firms comprised 40% of company total. The potential value and contribution, societal as well as economic, if these many firms can thrive and grow, is immense. The payoff of success would be explosive, but firms encounter many obstacles along the way.

Survival is a well-known challenge for small businesses - only 50% survive into their fifth year. A rigorous analysis demonstrated this rate and showed this survival rate
has been relatively constant in good and bad economic times. (Headd & Kirchhoff, 2009). Other data in the study showed less than 40% survived after year six. While portions were acquired by larger businesses or the owners elected to exit, many failed due to the inability to “hold on” or grow into medium or large businesses.

The research problem domain. Many SMEs are located in cities that are themselves seeking renewal as they face the decline and disappearance of large businesses and pin future hopes on the growth of SMEs. Two such cities are Rochester, New York and Charlotte, North Carolina. Although located in separate regions with distinct dynamics and economic trends, several factors make these two cities comparable. Each has a metropolitan statistical area (MSA) that is of significant, but not huge, population size (Rochester about 1,100,000, Charlotte about 1,007,000 in 2011). Each enjoyed the presence of a few business giants (Rochester’s Kodak and Xerox, Charlotte’s NCNB, now merged with Bank of America, and Wachovia Bank, now merged with Wells Fargo) that defined and provided for the region.

The first city, Rochester, New York, became a booming center of invention and manufacturing that thrived during the 20th century. Yet for the recent decades, Rochester has been dealing with the decline of its major companies. Through his business talents and generous philanthropy, George Eastman transformed Rochester and left a legacy in the powerhouse company Kodak and a rich portfolio of arts and higher education. The Rochester Business Journal (January 27, 2012; October 12, 2012; March 12, 2013) described Kodak’s rise and fall including its efforts for reinvention, its challenges, and its portended defeat. Kodak and its extensive supplier base made Rochester a “company town.” At its peak in 1982, Kodak’s local employment was 60,400, but with the
struggles, steadily declined to 16,300 in 2004. In 2012, Kodak filed for bankruptcy protection and employment dropped to 3,542 at year’s end (down 31% from prior year). Fortunately for Rochester, other companies had launched and grown. Of particular success was Xerox that entered the imaging industry and built a strong pioneering company based in Rochester. Its presence grew to approximately 16,000 in 1974 (Joe Ketchum, Xerox Manager of Investor Relations, personal conversation February 2013). Unlike Kodak that kept its center of gravity in Rochester, Xerox shifted its geographic center by moving headquarters functions to Connecticut in the 1970s. In 2008, Xerox employed 7,600 in Rochester (M2PressWIRE, 06/10/2008). Today, employment is approximately 5,800 (Ketchum). Further actions in other operations, including transfers, out-sourcing, and off-shoring, lead to more employment reductions locally. Overall in Rochester, the past twenty years have not been kind to manufacturing jobs, dropping from about 126,000 in 1990 to 61,800 in 2012 (Dickenson, 2012).

The Rochester area has faced the need for reinvention by seeking new sources of enterprise. In a report by the Center of Governmental Research (CGR), Gardner and Sittig (2012) summarized Rochester’s situation, “The broad base of smaller firms and diversity of industry clusters in the region has led to an economic stability for a region that was once dependent on just a few large firms in the manufacturing industry” (p. 1). The purpose of the study was to measure the regional stimulus created by the University of Rochester (UR) as well as its medical center, its affiliates in health care and startup support, and its partnership with IBM on the Health Sciences Center for Computational Innovation. Employing over 20,000 people, UR is the seventh largest employer in New York State. The CGR’s study concluded that UR’s “continued vitality and expansion has
become a foundation on which the growth of many sectors can be founded” (p. 35). Rochester has been undergoing Schumpeter’s creative destruction. Its transition to a “knowledge-based economy,” as described by Gardner and Sittig, has presented opportunities but also numerous challenges for the overall area.

The second city, Charlotte, North Carolina, had a long history of strength in financial services starting in the late 18th century when it was the center of America’s first gold rush. In the late 20th century as regulation opened to permit interstate banking, Hugh McCall and Ed Crutchfield, top leaders with vision and courage, built Charlotte into the country’s second largest financial service city. In “City after the Storm” (2012), journalist Joe Rauch related Charlotte’s efforts to overcome the effects of the shock in the finance industry and to diversify for regained vitality. At financial services’ peak years of 2006 and 2007, wages represented 20% of Charlotte’s private-sector. One banker reflected that Charlotte had been a “one trick pony” (p. 27). At the height, jobs in finance and insurance approached 58,000 jobs but by 2010 had dropped more than 10% (even before accounting for the impact of additional announced cuts). Since its peak, overall industry wages have declined by almost 13% (approximately $800 million). The impact on the community is apparent in taxes and the decline and closing of supporting businesses. Job losses have been felt in absolute numbers and the high pay-grade jobs that moved. In this wake that has clearly dampened its “upbeat, can-do” spirit, Charlotte has been welcoming new regional banking operations to pick up some of the slack resources but has expanded its efforts aggressively to diversify to other industries poised for future growth.

Today Rochester and Charlotte face the challenges of rebuilding to compensate for the changing role of those giants. SMEs have been playing central roles in recovery
and redefinition. Rochester’s and Charlotte’s Chambers of Commerce boast strength in manufacturing, health care, and energy as they push development in these industries.

As shown in Table 1.1, both Rochester and Charlotte MSAs are in the midrange of the top 100 MSAs (52 and 34 respectively). Both cities are cited as having strong vitality, entrepreneurial activity, and innovation capability. Further, each has growing relationships between SMEs and area universities and has an active incubator: High Tech Rochester and Charlotte’s Ventureprise. (Table also found in Appendix A for reference.)

Table 1.1

*Rochester, NY and Charlotte, NC – Measures of Comparison*

<table>
<thead>
<tr>
<th></th>
<th>Greater Rochester, NY</th>
<th>Greater Charlotte, NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population 2011 (MSA)a</td>
<td>1,055,278</td>
<td>1,795,492</td>
</tr>
<tr>
<td></td>
<td>#52 in USA</td>
<td>#34 in USA</td>
</tr>
<tr>
<td>Small Business Vitalityb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ranking in US top 100</td>
<td>#21</td>
<td>#24</td>
</tr>
<tr>
<td>Score</td>
<td>14.87</td>
<td>14.30</td>
</tr>
<tr>
<td># companies with 100 or</td>
<td>22,849 small businesses</td>
<td>43,520 small businesses</td>
</tr>
<tr>
<td>fewer employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation Indexc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total index (U.S. is 100)</td>
<td>100.4</td>
<td>95.2</td>
</tr>
<tr>
<td>State resources available</td>
<td>71.3</td>
<td>94.4</td>
</tr>
<tr>
<td>Economic well-being from</td>
<td>95.4</td>
<td>102.6</td>
</tr>
<tr>
<td>innovation activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to innovate –</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o human capital</td>
<td>113.1</td>
<td>119.0</td>
</tr>
<tr>
<td>o economic dynamics</td>
<td>79.9</td>
<td>86.4</td>
</tr>
<tr>
<td>Other</td>
<td>In U.S.’s top 5</td>
<td>In top 15 Creative</td>
</tr>
<tr>
<td>innovation-intensive</td>
<td>metro areas4</td>
<td>Cities5</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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*Ranking and population as of July 1, 2011, estimated by United State Census Bureau (accessed through Wikipedia.com on 8/20/2012). Business Journals On Numbers, annual ranking of best opportunities for small businesses to grow and prosper. Austin finished number one in 2010, 2011, and 2012 (with score of 46.88). Top 50 locations have positive scores and next 50 have negative scores. Innovation Index project conducted by Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University’s Kelley School of Business, and other research partners. Project is funded in part by the U.S. Commerce Department’s Economic Development Administration. The New Republic’s analysis using data from the OECD on patent applications (2012). Creative Cities International Vitality Index in 2011 as reported in the Charlotte USA Economic Guide.*
Theoretical Rationale

**Senior leadership.** Given its strategic importance, the responsibility for an organization’s ability to innovate successfully falls squarely on the shoulders of the senior leaders. Sustained innovation is difficult for all organizations. The young organizations are agile but usually lacking in capital. The established organizations are rich in capital but require major change efforts for renewal. Company efforts for renewal through innovation are a type of change effort. “Until changes sink deeply into a company’s culture, a process that can take five to ten years, new approaches are fragile and subject to regression” (Kotter, 2007, p. 102). Yet, CEOs’ tenures are increasingly short lived -- CEOs of large companies now average less than six years (Kaplan & Minton, 2011). Senior leaders must have the continued presence, attentiveness, and patience to ensure innovation’s success.

Birkinshaw, Bouquet, and Barsoux (2011) found general agreement among scholars and consultants on a number of proven conditions for sustained innovation: shared understanding; organization-wide alignment; tools and training; diversity; interaction mechanisms; and slack capacity. Senior leadership is charged with ensuring these necessary-but-not-sufficient conditions. It is challenged with producing the “necessary interplay between direction and empowerment;” “framing the innovation challenge,” “channeling the collective creative energy,” and “removing the risks of random or ill-focused innovation” (p.49). The role of senior leadership is active and complex.

**Senior leadership must embrace paradox.** Tushman, Smith, and Binns (2011) delineated the active role necessary to “navigate the tension between new innovations and
core products from the C-suite” (p. 74). Pushing down key decisions about balance between investments in core and innovation efforts creates “a collection of feudal baronies” (p.76). “The senior leaders are the only ones to hold the tension between the old and new and foster a state of constant conflict at the top” (p. 76). Their in-depth study of twelve top-management teams led to three leadership principles: develop an overarching identity; hold tension at the top; and embrace inconsistencies. “When leaders take this approach, they empower their senior teams to move from a negotiation of feudal interests to an explicit, ongoing debate about the conflicting interests on which the future of the business depends” (p. 77). Tushman and colleagues are working to reveal disruptors and derailers that have been happening under the radar and help organizations resolve these issues that have intensified during the recent profit crises. Their work has raised the challenges to the appropriate level for attention, that of senior leadership.

**Ambidexterity.** As research grows, debate ensues regarding how companies must respond to challenges of implementing innovation. Tushman and O’Reilly (1997) envisioned an “ambidextrous organization” where managers “play two different games simultaneously” (p. 3). One is the efficiency game for today using traditional management tools. The other is a revolutionary game for tomorrow requiring new skills and dynamics. “Because the power, resources, and traditions of organizations are usually anchored in the more traditional units, these units usually try to ignore, trample, or otherwise kill the entrepreneurial units” (p. 171). While incremental innovations best reside in the traditional business units, those innovations that are “architectural” and “discontinuous” (i.e., radical or revolutionary) are best served in a separate organization where they can be legitimized and protected.
Separate and concurrent efforts provide the basis for organization renewal to ensure future vitality. In the midst of the debate, companies face the dilemma of where to locate innovation efforts and how to empower them to ensure survival. Successful responses will include a “new design that enables a dual purpose for the organization: to exploit an existing business and to simultaneously explore a related new business” (Govindarajan & Trimble, 2005, p. 47). The notion of dual purpose is relevant to organizations of all sizes.

**Innovation projects in practice.** Innovation portfolios consist of projects that fall along a continuum from evolutionary to revolutionary (Rosenfeld & Wilhelmi, 2011). Evolutionary projects (continuous improvement) and product/market expansions perpetuate successful growth of current operations. Revolutionary projects are radical or breakthrough and include strategic innovations that pursue significant differences in customers, customer needs, or business processes of creating value (Govindarajan & Trimble, 2010). Evolutionary and revolutionary projects mandate distinct strategies, structures, processes, and cultures (O’Reilly & Tushman, 2004). To ensure success along the continuum, senior leadership must embrace paradoxes by “leading ambidextrously” (Tushman, Smith, & Binns, 2011).

The preponderance of research has studied innovation implementation in large established organizations. Recent research has extended thinking to implications for small and medium enterprises (SMEs) (Cao, Gedajlovic, & Zhang, 2009). The research looks at efforts to exploit the evolutionary projects and to explore the revolutionary projects. It tests the impact on results of the absolute investment in both types of projects and the balance between projects on the two ends. The presence of balance, the
researchers argue, is especially critical to results for SMEs. Because SMEs are resource-constrained as compared to large organizations, balance is essential to mitigating risks. Another influencing factor is “environmental munificence” that relates to critical external resources an organization may readily access, again especially important to SMEs.

(Appendix B)

Senior leaders are charged with uniting novel ideas with innovation project leaders while ensuring the organizational capabilities support success. Hidden below what senior leaders must do for the organization’s growth and renewal is what senior leaders prefer to do, their innovation strengths and preferences. Senior leaders of organizations large and small can become stretched beyond their preferences when initiating and managing projects across the Innovation Continuum™. In small and medium enterprises (SMEs), however, senior leaders have less depth and breadth of leadership talent to draw upon. This invisible but highly relevant factor is typically overlooked in discussions regarding innovation.

**Innovation Strengths and Preferences Indicator®.** “Companies don’t innovate, people do” has been the central theme of Bob Rosenfeld’s work. He has emphasized the personal aspects of innovation as related to people creating novel ideas and to implementing ideas with others within an organization. In 1988, Rosenfeld formed Idea Connection Systems, Inc. (ICS) “dedicated to helping organizations make innovation happen through people” (company literature, 2011). His work has built on his earlier “up close and personal efforts” at Kodak where he established and led its first Office of Innovation. ICS has focused on three areas: innovation leadership and culture, innovation inclusion by leveraging differences, and innovation systems.
Rosenfeld has sought to reveal the human element, the least understood of the innovation triad of business, technological, and human. The human dimension is comprised of principles, values, actions, methods, and behaviors and is the binding of the system leading to positive results. The human dimension is the “life force” and when it “breaks down, the system implodes on itself or splinters and breaks apart” (Rosenfeld & Wilhelmi, 2011, p. 6). In contrast to the business and technological dimensions, the human dimension is invisible and, therefore, easily neglected or taken for granted. To fill the void in understanding, he created eight human principles necessary for sustained innovation. His hope was to provide a common language and increase sharing of experience.

The foundations of the theory of the human dimension are described in *Making the Invisible Visible: The Human Principles for Sustaining Innovation* (Rosenfeld & Kolstoe, 2006) and later expanded in *The Invisible Element: A Practical Guide for the Human Dynamics of Innovation* (Rosenfeld & Wilhelmi, 2011). The eight principles include:

1. Trust is foundational.
2. Soft values drive the organization.
3. The elements of destruction are present at creation.
4. Leverage differences.
5. Co-locate for effective change.
6. Passion is the fuel and pain the hidden ingredient.
7. Innovation starts when people convert problems to ideas.
8. Innovation needs a system.
These eight timeless human principles are invisible in an organization but necessary for sustained innovation. The principles became the foundation and pillars of a multi-level model for sustained innovation which was named “The Innovation House” (See Figure 1.1).

**Figure 1.1. The Innovation House (Rosenfeld & Wilhelmi, 2011).**

The foundation (the first three) forms the “Innovative Environment.” The pillars (the following five) are the “essence of innovation.” The levels above are the visible and temporal elements of innovation: Organizational DNA, Invisible Rules of Engagement, Innovation Processes, and Quantifiable Gain. Rosenfeld and colleagues offered general strategies to practitioners for using the Innovation House: start from the foundation when building new organizations or teams, start from the top level when initiating new innovation, and look to the lower levels and pillars when quantifiable gain is falling short of expectations. Although ample description and advice for the innovation leader was made for each element of the Innovation House, this research study’s focus falls on Leveraging Differences.
The Leveraging Differences principle rests on the belief that “only by understanding and leveraging individual differences, coupled with fostering a trusting environment and appropriate soft values, can innovative potential ever be truly maximized” (Rosenfeld & Wilhelmi, 2011, p. 54). Unlike workers in the business model of the industrial age, seen as interchangeable parts, the knowledge worker of the 21st century brings a fuller set of skills, behaviors, and creativity that must be tapped in the pursuit of innovation. “Cutting and pasting” people for ill-fitting roles produces poor results. Leveraging Differences reaches deeper than the visible of photographic (gender, race, age) and resume (language, credentials, experience) to the less visible of behavioral (communication, culture, values) and even the invisible (affective style, conative style cognitive style). Understanding and leveraging people’s uniqueness determines whether “the something new” will be supported or killed. The success of innovation teams is highly dependent on appreciating and leveraging the less visible and invisible human dimension. This understanding is essential for individual practitioners, key decision makers, and the organization itself. Understanding the multiple layers of people’s uniqueness is helpful for raising self-awareness, constructive use of individual differences, and approaching problems in new ways.

With deep commitment to Leveraging Differences, Rosenfeld co-created the Innovation Strengths Preference Indicator® (ISPI™) to make visible the important, but invisible, predispositions for approaching innovation - how people like to innovate to solve problems and work with others. The ISPI™ was developed with the belief that innovation leaders must be effective in communicating across the range of innovation orientations. Identifying and valuing differences among people permits leaders to
leverage them (Rosenfeld & Wilhelmi, 2011). Leaders must also be self-aware in terms of their own innovation preferences, particularly if they strive to “lead ambidextrously.”

The creators of the ISPI™ developed this tool due to frustration with the host of available tools and instruments. They had been facing two difficulties: extensive synthesis of several tools was needed for an integrated picture; and significant interpretation was required to relate the findings to innovation. The ISPI™ integrates tools that look at three major areas: cognitive (how I think), affective (how I express my needs), and conative (how I instinctively behave). Feedback shows how a person prefers to innovate and how a person prefers to innovate with others. Results show an individual’s placements along twelve orientations; given approximately 38,000,000 possible combinations, an individual’s profile is like a “personal innovation fingerprint.”

Feedback locates an individual on a continuum from Builders to Pioneers. When innovating and considering existing paradigms, “a Pioneer challenges things, focusing on possibilities and doing things differently” while “a Builder accepts, focusing on reality solutions by associating thoughts on a single plane while Pioneers will bi-associate by connecting perspectives from multiple planes or domains for novelty. Builders will make steady progress in identifying and sorting through a reasonable list of ideas, simultaneously eliminating those deemed irrelevant, and then moving to the next problem. They will build and maintaining group consensus while acknowledging the rules. Their solutions tend to be evolutionary. In contrast, Pioneers path will be unpredictable, generating numerous ideas, relevant and irrelevant, and disregarding norms and rules. Their solutions tend to be revolutionary. Pioneers may be underappreciated or underutilized in an organization because they may not translate their
novel ideas into quantifiable gain or their ideas are future-oriented and solve problems not yet evident to the organization. Organizations have suffered due to their inability to leverage Pioneers, to guide these “spirited horses” without harnesses and sacrificed potentially great results.

People in the mid-range between Pioneers and Builders are called Bridgers. Simply described, Builders would naturally prefer projects that are incremental or expansionary. Pioneers would be most comfortable in breakthrough projects. Bridgers are in between the edges but have a general preference for one end of the paradigm continuum. Bridgers are very helpful to an organization with their ability to assist Pioneers in linking innovation ideas to the existing organization for greater success in implementation and to encourage Builders in reaching for greater degrees of innovation. Equally important, Bridgers provide needed means for Pioneers and Builders to work together more effectively. Given the multi-faceted dynamic of innovation, all skills are needed but assignment and collaboration are essential for an organization to progress. Senior leaders themselves must consider their own orientations to accentuate their strengths and build complementary teams to support their less preferred dimensions. Self-awareness and deliberate action can play a central role in creating sustained innovation and building an enduring organization.

**Organization.** “Grow or die” is a long-standing maxim in business with growth measured by indicators such as sales revenues, profitability, organization size, and marketplace reach. The concept of “creative destruction” has re-entered the scene as companies and countries ponder how to renew themselves lest they fall victim to outside disruptors. As Christensen demonstrated in his seminal work “The Innovators Dilemma”
(1997), the pursuit of traditional measures of growth, particularly margin growth, frequently made organizations vulnerable to entrants from below who took the underserved less-profitable segments. The resulting upsets have thrown the traditional mechanisms for driving growth into question.

Answering the challenge of growth depends on where organizations are located in their own stages of development and organizational size as well as whether they are the incumbents or the challengers. Large established organizations already challenged to become learning organizations (Senge, 1990) and embrace change (Kanter, 1983), now face the reality of creating sustained renewal efforts as well. While not encumbered by the inertia of large companies, small companies face important early stages that challenge them to achieve growth. A common view of organizational development is that of a life cycle: startup, grow, harvest, and terminate (van de Ven & Poole, 1995). Churchill and Lewis (1983) found unique dynamics in the early periods of small businesses and formed a five-stage development model: existence, survival, success, take-off, and resource maturity. The challenges of creating organizational capability vary depending on context.

**Environmental munificence.** Availability of resources is a major consideration in forming and executing a strategy. Resources, while typically greater within larger organizations, can become available through the external environment. Partnerships and affiliations can provide specialized resources. Financial capital availability is critical to funding innovation. The degree of scarcity or abundance of technical capability can influence the pace of innovation and implementation. The term “environmental munificence” was formed in organizational theory relating to capacity available from the
external environment. Found to be distinct from the environmental dimensions of dynamism and complexity, munificence is “the extent to which an environment supports the sustained growth of a firm” (Dess & Beard, 1984, p. 55). Organizations able to effectively access and utilize munificence are able to grow and create surplus (“slack”) for the future as investments in further innovation or as buffers for leaner times.

**Statement of Purpose**

The purpose of the research study is three-fold. The first area will be to inquire as to the presence of ambidextrous leadership in small and medium enterprises. The second area will be to identify how senior leaders of small and medium enterprises, having survived the startup stage, succeed in the growth stage, while advancing innovation. The third area will investigate how they balance the seemingly conflicting leadership roles of innovation for today’s business and for future renewal, given their individual innovation orientations.

**Research Questions**

This research study will investigate the following questions:

1. Based on interviews, is there evidence of ambidextrous leadership in small and medium enterprises (SMEs)?

2. In seeking to advance an organization on its innovation trajectory, how do senior leaders of SMEs ensure the capabilities both for exploiting current innovation and continuously exploring future innovations?

3. How do the innovation orientations of SME leaders motivate innovation and its implementation as measured by the Innovation Strengths Preference Indicator® (ISPI™)?
Potential Significance of Study

The purpose of the research is to investigate the phenomenon of growth as related to innovation implementation in small and medium enterprises (SME) in the United States. In review of this topic, information of this segment of American enterprise is sparse. The wide range of challenges facing SME senior leaders has been overlooked when compared to two decades of robust research on leading innovation in large established organizations and the recent seismic attention focused on startups. Little has been published on creating new enduring organizations that provide future regional growth and national strength. The Innovation Strengths and Preferences Indicator® (ISPI™) has not been tested on senior leadership in SMEs as a separate set to determine applicability. By comparing companies in two cities and the impact of the degree of support provided by the environments has on SMEs in the growth phase may provide lessons from a leading industrial region in the northeast and from a financial services center in the southeast.

Definition of Terms

*Ambidexterity:* The essence of ambidexterity is balancing the tensions between exploiting today’s capabilities to meet immediate survival and exploring future opportunities to ensure long-term viability. As related to dynamic capability, ambidexterity is “the specific capability embodied in senior leadership’s learning and expressed through their ability to reconfigure existing organizational assets and competencies in a repeatable way to adapt to changing circumstances” (O’Reilly & Tushman, 2008, p. 200).
**Ambidextrous leadership:** Senior leadership establishes and maintains deliberate efforts, typically separate, to exploit current capabilities for today and explore future opportunities for the future. Leadership holds the separate efforts together by “a common strategic intent, an overarching set of values, and targeted structural linking mechanisms to leverage shared assets. These internally inconsistent alignments and the associated strategic tradeoffs are orchestrated by a senior team with a common fate incentive system and team processes capable of managing these inconsistent alignments in a consistent fashion” (O’Reilly & Tushman, 2008, p.193).

**Creative destruction** describes how radical innovation continually displaces old products and methods and thereby disrupts entire industries and propels economies forward. The entrepreneur is the agent of innovation (Schumpeter, 1934).

**Environmental munificence:** The extent, from abundance to scarcity, that external resources are available to support growth of an organization (e.g., technological knowledge and industry information through external partnerships). (Cao, Gedajlovic & Zhang, 2009; Dess & Beard, 1984; Keats & Hitt, 1988)

**Exploitation:** “The essence of exploitation is the refinement and extension of existing competence, technologies, and paradigms. Its returns are positive, proximate, and predictable.” (March, 1991, p.85).” Descriptors include refinement, choice, production, efficiency, selection, implementation, execution.

**Exploration:** “The essence of exploration is experimentation with new alternative. Its returns are uncertain, distant, and often negative” (March, 1991, p.85). Descriptors include search, variation, risk taking, experimentation, play, flexibility, discovery, innovation.
Gandhian innovation revolutionizes markets and harnesses technology to serve the unserved. Focus expanded to include people. (Prahalad & Mashelkar, 2010)

Innovation: “The effort to create purposeful, focused change in an enterprise’s economic or social potential” (Drucker, 1985, p. 67).

Innovation Orientation (iO™): Indication of where individual prefers or are predisposed to work along the full innovation continuum. A person’s “sweet spot” for being innovative, composed of four unique “orientations.” (ICS material for ISPI™).

Innovation Orientation Modifiers (iOM™): Indicators showing how an individual “modifies” the approach developing innovative ideas – seek information, make decisions, find energy to generate ideas, work with others, and preferred action mode. Consists of eight unique “orientations” (ICS material for ISPI™).

Innovation Strengths Preferences Indicator®: An indicator that looks at twelve unique “Orientations” that affect how people approach innovation, drawing on research from all three aspects of mental functioning – how people think (cognitive), take action (conative), and meet their personal relational needs (affective). (ICS for ISPI™ certification)

Innovation trajectory: “A path over time encompassing both historical realized innovation strategy and future intended strategy.” (Nemanich, Keller & Vera, 2007)

Organizational ambidexterity: Initially conceptualized by March (1976) as the need for an organization to have dual structures: one to focus on learning for current needs and profits and the other for learning new knowledge to ensure future vitality. Later extended by Tushman and O’Reilly (1997) beyond separate subunits to distinct business models
for each, entailing different competencies, systems, incentives, processes and cultures—each internally aligned.

**Small and medium enterprise (SME):** Business organizations with annual revenues between $10 million and $1 billion and with employees numbering between 10 and 3,000.

**Strategic entrepreneurship:** Combination of “advantage seeking” with “opportunity seeking” in order to grow the organization and also improve society. The profit motive expands to include an equal focus on people. (Hitt, et al., 2011).

**Strategic innovation:** Innovation that departs from the established firm’s current business model (core business). Distinguished by significant difference in customers (“identification of potential customers”), customer needs (“conceptualization of customer value”), or the process of creating value (“value-chain design”). (Govindarajan & Trimble, 2010)

These definitions are repeated in Appendix C for reference.

**Chapter Summary**

Following the surge of interest in the area of innovation, innovation implementation finally arrived to the stage as the neglected but essential supporting actor. The key element in resolving the drama is balancing the need to exploit current capabilities for today’s needs while exploring potential capabilities for the future, the ability has been named “ambidexterity” and the organizations with such capabilities are described as “ambidextrous organizations.”

Many senior leaders have been calling for specifics on how to implement efforts so their organizations can achieve sustained innovation success. Most of this dynamic has
been occurring in large, established organizations. Most recently, interest in research and practice has expanded to small and medium enterprises (SMEs). SMEs, left in the shadows until now, had been upstaged by the interest in saving the large companies from the creative destruction that Schumpeter made famous last century and also by the intense interest on startup companies as a source of ideas.

This research study considers the future success and growth of these start-up companies so that they can become enduring enterprises. Similar to the interest in SMEs, this research study selects the domain of medium large cities which are focusing on renewing their base of enterprise for the future as well. SME senior leaders are individuals and bring their individual preferences that weigh into the interpretation of the drama that needs to play out. This study seeks to consider how they respond to the challenges as they lead their companies into the future.

Chapter 2 will provide a comprehensive review of the literature in the areas of innovation implementation, organizational and leadership ambidexterity, organization growth after an enterprise has succeeded in its startup phase, and, the associated demands on senior leadership. The background and use of the Innovation Strengths Preferences Indicator® will be summarized.

Chapter 3 will describe the methodology of this research study. The effort will utilize qualitative research including a Delphi study, semi-structured interviews, and use of the ISPI™ indicator. The research domain of SMEs will be further focused on a few companies in the two metropolitan areas described previously in this chapter – Rochester, New York and Charlotte, North Carolina.
Chapter 4 will present the findings of the study. Chapter 5 will review the results and implications. Limitations of the research and suggestions for further study will be covered. The significance of the research study and its findings will be summarized.
Chapter 2: Review of the Literature

Introduction

This chapter explores aspects of innovation relating to implementation and the organizational capabilities to ensure sustained innovation for growth and renewal, including barriers to success. The landscape is the organization. The players are senior leadership and the people they lead. Particular focus is paid to small and medium enterprises (SMEs) that have survived their startup phases and seek to thrive through continued growth.

The review of existing research was comprehensive, spanning a variety of sources and forms. In Christensen’s personal comments in the book “Seeing What’s Next: Using the Theories of Innovation to Predict Industry Change” (Christensen, Anthony & Roth, 2004), he wrote “Strategy and innovation are somewhere between unguided trial-and-error experimentation and rules-based science” (p. viii). The field of innovation implementation is even more nascent. Therefore, the exploration of the research expanded beyond scholarly articles to professional and popular publications available in print and electronically. The review of the scholarly literature included theoretical articles and meta-analyses. Awareness of the latest research efforts was afforded through innovation and entrepreneurial centers at leading business schools. This chapter draws on empirical research, theories, and also opinions resulting from theory or becoming the building blocks of new theory.
This research study was conceived with the lofty, although vague, aspiration of “making innovation stick” and so it started with defining the object of the effort - innovation. In the current environment where the term “innovation” has been used to describe any and all things remotely interesting, pinning down meaning for the term innovation as a basis for investigation was necessary. Storey and Salaman (2005) reviewed three possible approaches and presented concerns with each. First, the Latin root innovare means “to make something new” but they noted the difficulty in defining how much novelty was required. Secondly, establishing a specified level of change of the product or process ignored the degree of impact. Finally, the U.K. Department of Trade’s definition of “successful exploitation of new ideas” overlooked the separate need for successful application as well as the important role of failure on the path to later success (Storey and Salaman, 2005, p. 17-18). Informed by this evaluation of possibilities and shortcomings and faced with the need to select a working definition, this research study turns to management icon Peter Drucker who stated in his often-cited and republished article The Discipline of Innovation (1985), “innovation is the effort to create purposeful, focused change in an enterprise’s economic or social potential” (p. 67). This definition was deemed pointed, practical, and proven.

Innovation Implementation

Contrary to popular usage of the term, “innovation” does not equate to ideas alone. Novel ideas that revolutionize or transform are interesting and critical but insufficient to the innovation equation. Research of innovation has followed failure and investigated the phenomenon that innovation efforts were surging but results were poor. Koudal and Coleman (2005) summarized research studies on innovation failure rates,
“More than 85 percent of new product ideas never make it to market. And of those that do, 50 percent to 70 percent fail” (p.21). The urgency of the dilemma for management mounted as businesses were facing increasing competitive pressures and shifting industry dynamics. Research expanded into innovation implementation including the considerations relating to organizational capabilities and the human components of leading innovation efforts.

The strongest contributions to understanding the puzzle of innovation’s poor results were made by those who revealed the root causes embedded in the organizations themselves. These insights challenged fundamental assumptions about success factors. In exposing forces counter to innovation’s effectiveness, research re-enforced the need for increased attention on the area of implementation. This research focus appeared in the 1990s and has grown dramatically.

**The problem of illegitimacy.** Dougherty, a key front runner (then at McGill University and now at Rutgers University), conducted research of organizational design for innovation spanning over twenty years. Dougherty and Heller (1994) found that product innovation in large, established firms was “illegitimate.” The exploratory mixed-methods study involved 134 product innovators (within 40 product development efforts) from 15 large (average 54,000 employees, $9.6 billion revenue, multiple industries) and established firms (average 96 years) across multiple industries. In their interviews, Dougherty and Heller captured 1,024 illegitimacy passages, incidences of actions necessary for the product development but not consistent with the practices of that firm. After extensive effort to cluster and examine, eight themes emerged and fell into three broad problem categories under linkages necessary to successful product innovation:
market-technology; interdepartmental; and product-to-firm. The researchers analyzed solutions of the 134 illegitimacy problems and found that 57 innovations were resolved through one of three approaches (significantly different at $p=0.05$, one way ANOVA). Engaging usual firm practices resolved only 19% and addressed the linking problems. In 10% of the cases, “ceremonial solutions” provided legitimate means in the larger environment (such as renaming the effort a “venture” to work around the quality requirements) rather than actually resolving the linking problem. The majority (70%) of the solutions were resolved using reframing to address the linking problem by redefining work roles and relationships or re-conceptualizing (such as using metaphors to recast day-to-day practices). The overarching conclusion was a problem of illegitimacy such that “the constituent activities of effective product innovation either violate established practice or fall into a vacuum where no shared understandings exist to make them meaningful” (p. 200). These voids and clashes were not due to the scientific technological feasibility; rather they were the firms’ lack of readiness (i.e., organizational capabilities). With these findings as evidence, the researchers showed that innovation of organizational systems must be given attention equal to that of technological innovation. They submitted that the most important next question would be the necessary changes in “managerial ideology” to support legitimacy.

Building on the prior study of 1994, Dougherty and Hardy (1996) revealed that instances of creative, high-positioned individuals’ successes in innovative efforts were one-time events. This qualitative study appeared to use the research in the earlier study to identify themes and then conduct additional analysis to test the themes against the data. The in-depth interviews with the 134 innovators covered how resources flowed to the
innovation projects, how structures connected the projects to ongoing work in the organizations, and the extent the projects were included in the overall strategies. The concern was the organizations’ ability to sustain innovation continuously and, therefore, the study investigated the degree to which problems were resolved.

The long-established organizations had dominated multiple niches in their markets for decades but currently were facing increased competition and new technology, forcing the senior executives to take pause. All companies were headquartered in the United States with the exceptions of one in Canada and one in the United Kingdom. The 40 projects in the research were distributed across a range of innovation (categorized in the study as high, medium and low). This study consisted of interviewing multiple (2-10) people in each project (with the exception of 7 projects where only one was possible). Two years after the original study, they interviewed 98 people for additional insights.

Dougherty and Hardy found that successes occurred “in spite of organizational systems, not because of them, and were, accordingly, fragile, and vulnerable rather than parts of a sustained process” (p.1134). The organizations’ engrained barriers obstructed the connections necessary for new product efforts to link effectively with organizational resources, processes, and strategy. To gain deeper understanding, the researchers made systematic comparisons between cases at the extremes of ability to solve project-to-organization problems (ten with highest proportion and ten with lowest proportion). Success in resolving problems was seen as an indicator for repeatability of new product efforts within an organization.

The research identified three types of problems explaining the difficulties faced by the individual innovators: (a) vying for resources that were attached to other efforts
with limited slack available; (b) striving for collaboration with structures and processes suited for sustained routine work; and (c) attempting to form meaning themselves without clear strategic context in which to fit their efforts. These problems were sorted into within-project and project-to-organization (keeping the types of resources, collaboration, and strategy under each). Results showed that successful innovators solved a much higher proportion of problems (>50%) at the within-project level than unsuccessful innovators. In contrast, all innovators solved fewer problems (<50%) at the project-to-organization level. Specifically, these innovators struggled in “establishing working relationships with senior managers, getting cooperation from other divisions, and improving risk-adverse climates” (p. 1131). That successful projects occurred in spite of the organization indicated the poor chance of repeatability and sustained innovation. In fact when comparing the top ten (56% - 100% problems solved) with the bottom ten (0% - 17% problems solved), the clear distinction was the difference in tenure of the innovators. The top ten were the “old timers” who had the expertise and extensive network to “cajole resources, cross major functional and divisional boundaries and gain legitimacy from senior managers” (p.1145). The young innovators of the bottom ten had insufficient personal equity and expertise to compensate for the organizational systems working against them.

In the midst of the “anti-innovation” organizational dynamics, the researchers identified projects that separated sufficiently to hold to attributes of an ideal. These “bubbles of innovation” (p. 1145) had set up microcosms providing legitimacy in the eyes of the participants, sufficient resources, supportive processes, and adequate alignment between meaning and innovation. Participants noted autonomy (i.e.,
separation from management) and empowerment (i.e., own decision making) as positive factors. Despite being effective internally, Dougherty and Hardy observed vulnerability when leaders ventured outside the “bubble” to interface with other functions, such as manufacturing, related to implementation of the project.

Often, individuals striving to succeed were taking risks without the power base necessary to shape the outcome for success. Dougherty and Hardy warned that using veteran employees’ relational capital or coaching the newer managers on how to build theirs would be short-term patches that would crumble with a downsizing or merger. Instead, they proposed a lasting approach to sustained innovation by changing the “underlying configuration of power, from a personal network base to an organizational system base” (p. 1147). The researchers pointed to the power of meaning as essential to sustained innovation throughout an organization. Senior leadership holds the key to building meaning and empowering innovators through strategic discourse, resource allocation, information distribution, and visible support of innovation efforts.

Testing an innovation implementation model. Klein and Sorra (1996) developed a theoretical model for describing the critical factors for successful implementation of innovation. Implementation climate (skills, incentives and absence of obstacles) and innovation-values fit were the two key determinants. They predicted outcomes would vary depending on the combination of implementation-climate (strong or weak) and innovation-values fit (poor, neutral, or good); to each combination, they ascribed likely employee reactions regarding effects of and innovation use. The model was built to encompass the organization, the manager and the individual employee perspectives (see Figure 2.1).
Dong, Neufeld, and Higgins (2008) conducted an empirical study of Klein and Sorra’s model which they credited with “providing a fundamentally new approach to understanding organizational change associated with innovation implementation...a unique and holistic theoretical perspective” (p. 239). They assessed previous empirical studies using Klein and Sorra’s model to be “partial” in evaluating only a portion of the relationships among the diverse factors. The objective of this study was to evaluate each of the eight relationships among the factors of Klein and Sorra’s model, with the focus on the individual employee.

The research was quantitative and studied companies (seven companies, 209 respondents) with innovation efforts that were radical rather than expansionary. The innovation projects were large-scale implementations of computer software applications.

*Figure 2.1. Determinants and Consequences of Innovation Implementation Effectiveness (Klein & Sorra, 1996).*
for administration. They were significant given that innovation efforts associated with major information system (IS) implementations have hugely disappointing track records (i.e., over budget, missing schedule and under-delivering results). Dong et al., cited the poor results of major expenditures in large IS efforts: slightly over a quarter completed on time and within budget and of those, less than 60% delivering promised capabilities as reported in a large US study and confirmed by a Canadian study showing less than 40% realizing expected benefits (p.239).

The study formed four sets of hypotheses (eight in total) and analyzed results using the partial least squares (PLS) method. The hypotheses stated positive associations between the determinant sets and the factors that followed and similarly between the factors and implementation effectiveness. While Klein and Sorra’s model is multilevel, this study focused on the individual. (See Figure 2.2 for hypotheses of associations H1a, H1b, H1c, H2a, H2b, H2c, H3, and H4).

Phase one developed the scale utilizing a card-sorting to define measurement items for implementation climate, skills, incentives, absence of obstacles, and affective commitment. IS experts and practitioners were engaged to assess the face validity of the items. Sixteen judges conducted four rounds of card sorting, making revisions following each sort, and yielding 35 measurement items. To ascertain inter-judge agreement, Cohen’s K scores were calculated along the process with the final score of 0.89 (above recommended level of 0.65). Two factors were constructed using measures from the literature rather than card sorting. For innovation-values fit, the researchers selected measures for the match between the innovation and the task requirements valued by the users: output quality, information locatibility, and collaborative flexibility. Mean scores
were taken for each dimension and these became the measurement items. The seven items for implementation effectiveness, adapted from earlier work by Klein and colleagues, related to employees using the system with skill, commitment, and enthusiasm.

Phase two involved a survey of mid- to large-sized Canadian manufacturing companies. A letter was sent to 800 companies yielding seven that consented and met the study conditions. The number of questionnaires that were returned and usable was 209 (30-42 per organization). The resulting demographics were distributed along gender, age, education, position type, training, and IS implementation experience.

Data analysis used partial least squares (PLS), a type of structural equation modeling. PLS was selected because it works well in early stages of research to investigate new theories. Individual reliability was achieved by evaluating loadings and making adjustments. When the model was retested, most items passed the 0.7 cutoff; the four exceptions were close and were retained. For convergent validity, average variance extracted (AVE) was calculated for each construct and all constructs exceeded 0.5. All composite reliabilities were above 0.7 indicating internal consistency reliability. The measurement model was deemed satisfactory. The PLS analysis showed “63.4% of the variance was explained by skills, incentives, obstacles, and affective commitment, which in turn were significantly affected by implementation climate and innovation-values fit” (p. 249). For the next step, the researchers examined the structural relationships among the constructs.

All hypotheses were supported; positive associations were established for each link (see Figure 2.2). The combined effect of climate and fit was confirmed. The
mediation effects of incentives and absence of obstacles between implementation climate and implementation effectiveness were confirmed. The mediating role of user commitment between innovation-values fit and implementation effectiveness was partially confirmed. The mediating role of skills between implementation climate and implementation effectiveness was not confirmed.

![Figure 2.2. Klein & Sorra’s Innovation Implementation Model and PLS Results (Dong et al., 2008).](image)

The implication for senior leaders is the importance of attending to the human aspects of implementation climate and innovation-values fit. Further, the associated systems supporting the human efforts mandate attention and interference in order to fulfill the promise of innovative ideas. Each factor has an enabling role in the overall implementation effectiveness.
**The missing piece of implementation.** After an intense decade of investigation summarized in their book *The Other Side of Innovation: Solving the Execution Challenge*, Govindarajan and Trimble (2010) of the Tuck School of Business at Dartmouth University identified organizational readiness to be lacking and promoted an expanded notion of innovation that includes commercializing ideas. They propounded that efforts designed as “innovation equals idea” or “innovation equals idea plus leader” are doomed to failure. The missing elements of the equation are team (i.e., “with a custom organizational model”) and plan (i.e., “that is revised only through a rigorous learning process”) in order to move innovation to execution successfully (p. 16).

In an interview with *The Economist*, Govindarajan (2011) summarized the root cause of innovation’s poor implementation track record – people are missing the organization part. These missing implementation pieces include a dedicated team and a plan. As a quick explanation, he cited Thomas Edison’s famous observation of “genius is 1 percent inspiration and 99 percent perspiration.” He then outlined the underlying cause for the absence. First, ideas themselves are more glamorous than execution. Second, generating ideas does not create the conflicts of resource allocation inherent in implementation. Finally, businesses mistakenly credit themselves as being strong in execution when, in fact, these capabilities exist primarily in executing today’s business dynamics and are not the capabilities needed for executing innovation.

In contrast to the sparse state of the science two decades ago, innovation implementation has seen “dramatic and productive surge of research” (Govindarajan & Trimble, 2010, p. xii). Indeed, Govindarajan and Trimble’s decade of research starting in 2000 built on the findings and momentum of their colleagues of the 1990s who entered
the fray and challenged the thinking of the day. They also made it accessible and applicable to the business community.

Looking back to the business dynamics of the 1990s, Dougherty and her colleagues undertook rigorous study of formidable businesses, “giants” in their industries, who were initiating major product development efforts. Many were struggling to create a sustained flow of innovation. Like a cry of “foul” in the game of product development, Dougherty’s research focused on the missing and misaligned organizational elements and on the challenges of implementing innovation in a context unable to support it. Her work came at a time when there was a dearth of research in innovation implementation. She was a strong researcher and a frontrunner. In the subsequent years, the literature in innovation implementation has been growing steadily, especially ignited by the concurrent insight that strategy is more about innovating to serve customers than protecting a steady-state definition of market space. The challenge of serving and defending today’s market space while simultaneously expanding with innovation into future spaces is at the heart of the dilemma. This duality presents a host of paradoxes. An area of research and practice addressing this discord emerged around the notion of organizational and leadership ambidexterity.

**Ambidexterity**

The first identified use of the term “ambidextrous” was by Duncan (1976) in the title of his paper, *The Ambidextrous Organization: Designing Dual Structures for Innovation*. Duncan noted the phases of innovation to be initiating and implementing and prescribed, for each, different structures requiring distinct degrees of complexity, formalization, and centralization. While his argument centered largely on organization
design and process, he acknowledged various human dynamics needing attention: conflict resolution, interpersonal skills, switching rules between the structures, and institutionalizing the dual structures (i.e., senior leadership legitimization). For example, “Switching Rule #3. The more radical the innovation, the more the organization should use different structures for initiation and implementation” (p. 183). Duncan set the stage for future contemplation and conversations, and while his straightforward model of one structure for R&D and another for manufacturing and marketing has not proved sufficient, he installed the thinking of duality with the metaphor of “ambidextrous.”

After a relatively quiet period during the following decade, March (1991) engaged the notion of ambidexterity to illuminate a fundamental issue, the hazards of permitting an organization to adapt naturally thereby bias resource allocation and knowledge creation to today’s needs while neglecting innovation needed for the future. The essence of ambidexterity is balancing the tensions between exploiting today’s capabilities to meet immediate survival and exploring future opportunities to ensure long-term viability.

Teams of thought leaders in ambidexterity have emerged including Tushman (Columbia University and now Harvard University) and O’Reilly (Stanford University) as well as Govindarajan and Trimble (both at Dartmouth University). A small crowd of active researchers rapidly built a base of empirical studies investigating a broad array of key considerations such as: ambidexterity’s effect on performance, antecedents and consequences, organizational versus contextual approaches, and implications for senior leadership.
Learning to explore and exploit. March (1991) followed Schumpeter’s focus on creative destruction into the second half of the century and entered the debate on adaptive processes and the relation between “exploration of new possibilities” and “exploitation of current certainties” (p. 71). In his often-cited (over 11,000) article, *Exploration and Exploitation in Organizational Learning* (1991), March created two theoretical models of knowledge development and use. He introduced the element of choice such that organizations, in competing for scarce resources, make numerous choices regarding strategy and investments, all defining their ultimate orientation. An overemphasis on the future, he argued, would lead to excessive experimentation without adequate gain to support ongoing operations. An overemphasis on exploiting current capabilities would lead to a “suboptimal stable equilibria” (p. 77) and put future viability at risk. A balance of exploration and exploitation is essential. The dilemma is that adaptive processes tend to refine exploitative learning (at the individual and organizational levels) more rapidly because they favor improvements on known skills and conditions and also provide quick, tangible feedback. This dynamic is effective in short-term gains but is self-destructive in the long-term as a result of neglecting future needs. To ensure adequate exploration efforts, deliberate consideration in resource allocation processes must be made to acknowledge the longer timeframes and less certainty of discovery as well as redefine individuals’ relative contributions. Leadership’s challenge is to create organizational practices to ameliorate natural tendencies of adaption and provide a pathway to prosperity. The balance of exploitation and exploration must be managed deliberately.

Leveraging the paradoxes of innovation. Andriopoulos and Lewis (2009, 2010) investigated the inherent paradoxes associated with surmounting this challenge in their
four-year research effort funded by the Carnegie Trust for the Universities of Scotland. The work sought to respond to the gaps in organizational dexterity research to discover how companies foster this capability. They investigated how highly innovative companies managed the various inherent paradoxes, looking at perspectives spanning the levels of top management, projects, and creative workers.

The research effort was presented in two articles. The first article, describing five companies, was released online in *Articles in Advance* in 2008 and in print in *Organizations Science* the following year as part of a special issue on organizational ambidexterity. In 2010, a fuller version with seven companies (two companies added) was titled *Managing Innovation Paradoxes: Ambidexterity Lessons from Leading Product Design Companies*, and published in *Long Range Planning*. The results had expanded from the first article; yet, they were consistent. Both articles covered similar and distinct aspects of the study. In the second, interpretation of the findings had evolved to the next level.

The first article, *Exploitation- Exploration Tensions and Organizational Ambidexterity: Managing Paradoxes of Innovation*, related details of the comparative case study. The researchers investigated seven US-based companies in the new-product-design (NPD) industry. Company size ranged from 16 to 250 employees and $1.2 million to $37.5 million in annual revenues. Total projects completed to date ranged from 250 to 10,000. The companies had been in business for one to four decades. All had achieved numerous patents and design awards. Headquarters were located on the east or west coasts, and most had multiple offices. The projects were from a wide range of industries (e.g., computer hardware, consumer and health products). Each company had a mix of
familiar projects (to exploit current competencies) and new projects (to create new capabilities). These companies’ extensive project portfolios were seen to represent successful and ambidextrous enterprises in NPD.

The insights from each case were used to inform (i.e., confirm or disconfirm) the findings from the others. Depth and breadth were achieved through three modes of data gathering: interviews for theory building, archival reviews, and observations. Interviews began with the CEOs or founders of the companies. Using a “snowballing technique” where the initial informants were asked to recommend other highly knowledgeable people to meet, the researchers identified and interviewed 114 informants throughout the seven companies. Two researchers conducted semi-structured interviews. The four-stage data analysis moved towards identifying specific themes related to areas of tension and the approaches that management used to address them. In the first stage, broad categories of tensions were identified for each case. Two coders examined the interviews for comment indicating tensions and categorization (intercoder agreement $k = 0.82$). Discussions resolved disagreements. Stage two involved linking concepts within each case leading to second-order themes. Asking the CEOs or founders of the companies to review their own completed case study provided additional input as well as a reality check. Related concepts were linked in stage three of the analysis to reveal aggregate dimensions. The reliability of each dimension was evaluated using the second coder and the two authors. The final stage encompassed building a theoretical framework and incorporating research on ambidexterity and paradox to enhance understanding and labels.
The research illuminated the potential of managing paradox to enable adaptation, change and renewal. “The case study companies embraced nested paradoxes of innovation: long-term adaptability against short-term survival; possibilities-constraints; diversity-cohesiveness; and passion-discipline” (Andriopoulos & Lewis, 2010, p. 104). Three lessons for leadership emerged from observing the companies. First, paradox can frustrate or fuel innovation and therefore must be managed deliberately. Next, managers can address seemingly conflicting objectives with a combination of integrating and splitting efforts. Since paradoxes cross organizational levels, management is shared. Overarching the challenges was the management thinking that shifted from “either/or” choices to “and/both” for the various paradoxes. “Lastly, paradox guides a common managerial approach but enables contextual variations” (p. 118) such as company size and resources available. New attitudes revealed a new paradigm extending leadership for all in the company to embrace. Exploring and exploiting had been fueled and reinforced.

**Understanding the challenges of organizational ambidexterity.** Organizational ambidexterity has become widely discussed in the literature as the means to exploit current competencies for today’s profit while also exploring future capabilities for growth and renewal. Cao, Gedajlovic, and Zhang (2009) endeavored to unpack organizational ambidexterity conceptually into a balance dimension (BD) and a combined magnitude dimension (CD). They challenged two previous conceptualizations of the exploitation and exploration quest, one advising to balance the two adroitly and the other to maximize both ambitiously. They pushed beyond the broad notion of ambidexterity as a blend of the two in varying mixes and argued that each dimension must be understood distinctly and the interrelationship studied. The influence of organization size and environmental
munificence were incorporated. Finally, they tested the relationships of these aspects to firm performance. Their analyses encompassed conceptual and empirical research.

The work at the conceptual level reviewed prior research of exploitation’s focus on existing products and services as contrasted with exploration’s orientation to new products and markets. Conceptually BD was expected to reduce performance damaging effects of over-engaging on one side versus the other. CD was expected to have the powerful potential of enhancing performance across both. Cao et al. arrived at a model representing exploration and exploitation as distinct but related dimensions (see Figure 2.3). BD was calculated to be the absolute value of the difference between exploitation and exploration – the more in balance, the higher the BD score. CD was calculated to be the combined magnitude, measured as the product of the two efforts.

**Figure 2.3. Two Dimensions of Organizational Ambidexterity (Cao et al., 2009)**

A series of seven hypotheses represent the two dimensions and the contingency variables of size and environmental munificence. All are related to firm performance (see Table 2.1).
Table 2.1

_Hypotheses for Unpacking Ambidexterity_

<table>
<thead>
<tr>
<th>Hypothesis</th>
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<tbody>
<tr>
<td>Hypothesis 1A</td>
<td>BD is positively related to firm performance.</td>
</tr>
<tr>
<td>Hypothesis 1B</td>
<td>CD is positively related to firm performance.</td>
</tr>
<tr>
<td>Hypothesis 1C</td>
<td>High levels of both BD and CD synergistically lead to better firm performance.</td>
</tr>
<tr>
<td>Hypothesis 2A</td>
<td>Organization size moderates the relationship between BD and firm performance. High BD is more beneficial for smaller firms.</td>
</tr>
<tr>
<td>Hypothesis 2B</td>
<td>Organization size moderates the relationship between CD and firm performance. High CD is more beneficial to larger firms.</td>
</tr>
<tr>
<td>Hypothesis 3A</td>
<td>Environmental munificence moderates the relationship between BD and firm performance. High BD is more beneficial for firms operating in less munificent environments.</td>
</tr>
<tr>
<td>Hypothesis 3B</td>
<td>Environmental munificence moderates the relationship between CD and firm performance. High CD is more beneficial for firms operating in more munificent environments.</td>
</tr>
</tbody>
</table>

Research was conducted with surveys of 122 small and medium enterprises in three high-technology parks in different economic zones China. These technology firms in a transitional economy faced a high degree of technological and institutional uncertainty; thus, strategic decisions would cause a wide variety of choices and variability in ambidexterity.

The chief executive officer (CEO) and the chief technology officer (CTO) each separately completed a survey. Because the firms compete on technology and new products, the CTOs were seen as having important roles in setting strategies and priorities. The researchers checked for potential nonresponse bias as well as differences
relating to firm age, size and industry. Geographic locations were spread although not evenly.

The 1-7 Likert scale was employed for the measures of firm performance, exploration and exploitation with Cronbach alphas of 0.89, 0.82, and 0.79 respectively. Further validity checks confirmed correlations and convergences. The balance dimension (BD) used the absolute difference between exploration and exploitation which ranged from 0 to 3.25. A high level of BD showed a closer match in the relative magnitudes of exploration and exploitation activities. BD and CD were shown to be independent dimensions.

Environmental munificence was measured using the average three-year sales growth rates of firms within the industry in that region. To reflect the resources available to support growth, all firms in the company’s industrial park were included. Noteworthy among the control variables was geographic location since regional development had been uneven in the Chinese economy. Environmental instability was another control factor to account for volatility or unpredictability in that region.

Ordinary least square regression analyses was the method to evaluate the hypotheses (H1A, H1B, H1C) and hierarchical moderated method to test the interaction hypotheses (H2A, H2B, H3A, H3B). The researchers found strong empirical support for five of the seven hypotheses (see Table 2.2)
Table 2.2

*Results for Unpacking Ambidexterity*

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1A</td>
<td>H1A was not supported. Model 1 was used to test and showed exploration was positively related to performance but the effect of exploitation on performance was not significant. Similarly, model 2 failed to prove H1A.</td>
</tr>
<tr>
<td>Hypothesis 1B</td>
<td>H1B was supported with model 2.</td>
</tr>
<tr>
<td>Hypothesis 1C</td>
<td>H1C was supported. Model 3 and model 4 proved H1C demonstrating a robust relationship between BD and CD that related synergistically to performance. The interaction between BD and CD is positive and significant. The plots showed firms were at greatest risk with low BD, high CD at times of low performance.</td>
</tr>
<tr>
<td>Hypothesis 2A</td>
<td>H2A was supported with greater impact on smaller firms.</td>
</tr>
<tr>
<td>Hypothesis 2B</td>
<td>H2B was supported and also showed a high CD to be risky for smaller firms which lack large resources.</td>
</tr>
<tr>
<td>Hypothesis 3A</td>
<td>H3A was not supported. The BD*environmental munificence interaction term was insignificant.</td>
</tr>
<tr>
<td>Hypothesis 3B</td>
<td>H3B was supported. The CD*environmental munificence interaction term was significant. Plot of the interactions showed firms operating at a higher level of CD have high performance in times of high munificence but lower performance in times of scarcity.</td>
</tr>
</tbody>
</table>

The results show BD and CD to be distinct empirically as well as conceptually. They each enhance firm performance but differently. Together, BD and CD work synergistically for firm performance. Resource constrained firms benefit more from BD and resource rich firms more from CD.

The study contributed to understanding organizational ambidexterity by theorizing explicitly about the balance dimension and the combined dimension of
exploitation and exploration efforts. The empirical tests on China-based high-technology firms strongly supported the theoretical concepts. They demonstrated a “firm’s resource conditions differentially affect the performance consequences of these two dimensions” (Cao et al., p. 794). The theory and research results provided greater clarity and usefulness regarding dynamics of organizational ambidexterity. The researchers extended the findings to advice for managers in resource-constrained setting to focus on the trade-off between exploitation and exploration efforts and for managers with sufficient resources to pursue both.

**Ambidexterity for small and medium enterprises (SMEs).** Most prior research on ambidexterity has studied exploitative and explorative efforts in the context of large businesses. In the conclusion discussion, Cao et al. (2009) related their findings to advice for smaller, resource-limited businesses to focus on the balance dimension in sustaining innovation while meeting exterior challenges (in contrast, large resource-rich businesses need to concentrate on the absolute magnitude as measured by the combined dimension). Building on this work, Chang, Hughes and Hotho (2011) studied 256 small and medium enterprises (SMEs) and investigated internal and external considerations (“antecedents”) and effects on firm performance (“innovation ambidexterity outcomes”). The balance dimension (BD) of Cao et al.’s earlier work was the measurement for ambidexterity to determine the extent that both exploitation and exploration efforts were underway (the absolute value of the difference to indicate balance between the two).

The researchers reviewed the literature and formed three hypotheses:

- **Internal organizational antecedents of BD of innovation ambidexterity**

  (H1): Internal organization with high centralization and high connectedness is
positively associated with the appearance of innovation ambidexterity (i.e., BD) in SMEs.

- **External environmental antecedents of BD (H2):** An environment with high dynamism and high competitiveness is positively related to the appearance of innovation ambidexterity (i.e., BD) in SMEs.

- **Mediating effects of BD (H3):** In SMEs, (a) the effects of centralization and connectedness on firm performance are mediated by innovation ambidexterity (i.e., BD), and (b) the effects of dynamic environment and competitive environment on firm performance are mediated by innovation ambidexterity (i.e., BD).

Small and medium sized businesses in Scotland were contacted to participate in a survey. The climate for innovation appeared ripe for study due to Scotland’s concerted efforts over several years to drive economic growth. One thousand firms were selected randomly from the FAME database. Two mailings and telephone calls led to a yield of 265 firms (26.5%) over an eight-month effort. Respondent firms were in industries represented by approximately one-third manufacturing and two-thirds service. Approximately one-half were small firms (less than 50 employees) and one-half were medium (50 to 249 employees). Participants were managing directors and members of the top management team.

In the 265 firms, one managing director and one top manager responded for two responses per firm. The surveys included twenty-two questions and employed a seven-point Likert scale to indicate extent of agreement with aspects of their companies’ business. The researchers used an inter-rater reliability coefficient to determine
intragroup reliability ($r_{wg}$) and found average intragroup reliability was 0.79, indicating
good agreement and allowing individual team member scores to be combined for
analyses. To aggregate the two groups (managing directors and top-management
members), the researchers used a two-layer echelon approach to average the responses.
Then the two scores were averaged to create an overall firm score.

The researchers checked for non-respondent bias by comparing the first third and
the last third of the phone call round and found no significant differences ($p < 0.01$) and
performed another comparison on the first 10 per cent and last 10 per cent ($p < 0.01$). No
significant differences were found. Subsamples were compared on dimensions of
descriptive variables and revealed no significant differences ($p < 0.05$). Various post hoc
tests proved no single factor to suggest common method bias.

Respondents indicated the extent of agreement with aspects of their companies’
business using a seven-point Likert scale. The researchers operationalized the constructs
using the literature. The dependent variables were innovation ambidexterity (i.e., BD
measured following the Cao study) and business performance. Independent variables
consisted of an internal set and an external set. Internal organizational structures were of
centralization and connectedness. The control variables were firm age, firm size and
industry sector.

There appeared to be a positive significant relationship between internal
organizational characteristics and innovation ambidexterity in two models ($\beta = 0.173$ and
$\beta = 0.173$, $p < 0.01$). Further, there was a positive significant relationship between
external environmental conditions and innovation ambidexterity ($\beta = 0.19$, $p < 0.05$).
Hypotheses one and two were supported. For hypothesis three, analysis evaluated the
innovation ambidexterity mediation effect on the link between internal organizational structure and external environmental conditions and firm performance. Results supported hypothesis three with a partial mediation effect, 95 per cent confidence limit.

Results showed the critical components of ambidexterity affect SME’s outcomes differently than those of large firms. Centralization and connectedness facilitate concurrent and balanced exploration and exploitation. This research showed external forces were direct rather than moderating forces on outcomes. SMEs would be advised to allocate innovation to achieve a close balance (BD). The findings support Cao et al. (2007) regarding SME’s scarcer resources necessitating a greater need for balance (BD).

Managers were encouraged to allocate resources not only for balance between exploration and exploitation but also to utilize internal competencies to response to external environmental dynamics. The researchers encouraged further research to explore how “the ability and willingness of top managers in SMEs influence the development of innovation ambidexterity” (2011, p. 1672). They suggested survey and case study research to look at top managers’ characteristics and the presence of ambidexterity in SMEs.

**Ambidexterity at the individual manager level.** The majority of the literature has considered organizational ambidexterity as the firm’s capabilities of exploring while also exploiting. Joining a more recent inquiry into the leader’s role in this dynamic, Mom, Fran and Volberda (2009) sought understanding at the individual level by studying business unit leaders and operations managers in major corporations. Their research was conceptual development and qualitative study of 716 managers in five major companies.
Based upon the literature, Mom et al. drew three characteristics common to ambidextrous leaders: host contradictions; are multitaskers; and both refine and renew their knowledge, skills, and expertise. They developed a conceptual model and shaped eight hypotheses for empirical testing with the objective of investigating direct effects of selected attributes (four hypotheses) as well as the interaction effects (four hypotheses), (see Table 2.3).

The researchers selected five major firms in the top 25 of the Fortune Global 500. Firms represented different manufacturing and service industries (electronics, financial services, accountancy and professional services, telecommunications, and chemicals). These industries were facing clear drivers for exploration (i.e., technology change, increasing customer demands, intensifying competition, and tough regulation). Concurrently, these industries were maintaining focus on exploiting due to immediate competitive dynamics and profit pressures.

The researchers sent surveys to 1797 business unit and operational level managers across the firms. The survey sample across hierarchical and functional levels within each firm indicated no bias as compared with the distribution of all managers using chi-square tests ($p < 0.05; \alpha = 0.05$). Surveys returned in complete form totaled 716 (215 business-unit level managers and 501 operational-level managers). Analyses indicated nonresponse bias not to be a concern. Respondents distribution was similar to population across firms, hierarchy and functions using chi-square tests ($p < 0.05; \alpha = 0.05$).
Table 2.3

Hypotheses for Ambidexterity at Individual Manager Level

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Hypothesis 1</td>
<td>A manager's decision-making authority will be positively related to this manager's ambidexterity.</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>Formalization of a manager's tasks will be negatively related to this manager's ambidexterity.</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>Participation in cross-functional interfaces by a manager will be positively related to this manager's ambidexterity.</td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td>There will be an inverted U-shaped relationship between connectedness of a manager to other organization members and this manager's ambidexterity.</td>
</tr>
<tr>
<td>Hypothesis 5</td>
<td>There will be positive interaction effects between a manager's decision-making authority and participation in cross-functional interfaces by the manager, on this manager's ambidexterity.</td>
</tr>
<tr>
<td>Hypothesis 6</td>
<td>There will be positive interaction effects between a manager's decision-making authority and connectedness of the manager to other organization members, on this manager's ambidexterity.</td>
</tr>
<tr>
<td>Hypothesis 7</td>
<td>There will be positive interaction effects between formalization of a manager's tasks and participation in cross-functional interfaces by the manager, on this manager's ambidexterity.</td>
</tr>
<tr>
<td>Hypothesis 8</td>
<td>There will be positive interaction effects between formalization of a manager's tasks and connectedness of the manager to other organization members, on this manager's ambidexterity.</td>
</tr>
</tbody>
</table>

For the dependent variables, the researchers created a means for measuring a manager’s ambidexterity. They developed measures for exploration (seven measures) and for exploitation (seven measures) at the managerial level. They then conducted six in-depth interviews to increase content validity and improve wording. Next, a qualitative test checked convergent and discriminant validity with 33 managers and revealed five
ambiguous items. Finally, twelve in-depth interviews provided feedback for improving the five ambiguous items. The final version of the scales inquired the extent of engagement in each of the “explore” and “exploit” areas. An exploratory factor analysis with varimax rotation enabled the researchers to reduce factors to a minimum number and kept the factors statistically independent. To construct the two explore and exploit scales, several items measuring the same variable were given and the responses summed. (Each summated scale had an Eigenvalue > 3.6). Both scales were shown to be reliable, all items loaded on their appropriate scales ($\alpha = 0.90$ and 0.87).

The independent variables represented formal structure and personal coordination mechanisms. Existing four-item scales provided measures for manager’s decision-making authority, formalization of a manager’s tasks, and connectedness of a manager to other organization members. To measure cross-functional interfaces by a manager, the researchers adopted an existing assessment and adapted it with weightings. The research controlled for firm size, environmental dynamism, and managers’ experience, function, hierarchical level and education.

All but two hypotheses were supported. In hypothesis two, rather than being a negative effect on ambidexterity, formalization of managers’ tasks was slightly positive, although not significant. In hypothesis four, the researchers expected an inverted U-shape relationship with connectedness using the rationale that too much would consume excessive time and reshape the unit’s thinking and norms. This hypothesis was not supported; rather a positive relationship without a diminishing effect was revealed. Also noteworthy in the findings, the coefficient of cross-functional interfaces was a larger
effect on ambidexterity than decision-making authority. Similarly, the coefficient of connectedness showed a larger effect on ambidexterity than decision-making authority.

**SME Growth on the Innovation Trajectory**

Understanding the challenges facing SMEs seeking growth requires an appreciation of the dynamics of developing beyond the survival years of a startup and moving toward maturation. Some research has focused on the “in-between stage” of SMEs and illuminated the particular aspects requiring special considerations. Recent research emphasizes the criticality of continued innovation and entrepreneurial spirit.

**Beyond the startup.** Churchill and Lewis (1985) studied the unique dynamics of small business growth and provided a new framework. They began by reviewing the business development models of the prior two decades. They then created a new model based on the work of Steimetz and Greiner and expanded based on their experiences. They tested the model with questionnaires (83 respondents from 110 distributed at an executive program for small business); all were owners of successful businesses with annual revenues of $1 million to $35 million. Preliminary data analysis revealed three deficiencies. They revised and applied the framework to the questionnaire responses. The results were sufficiently strong to encourage further work.

Churchill and Lewis identified three issues with the previous models: the assumption that all companies must pass through all stages or die, the absence of important early stages in origin and growth, and an incomplete definition of size that is only based upon sales volume. The five-stage model is distinctive in that a company can move along one of two paths in its success stage. The stages include:

- Stage I Existence
• Stage II Survival
• Stage III-D Success-Disengagement
• Stage III-G Success-Growth
• Stage IV Take-off
• Stage V Resource maturity

For Stage III-D, formal systems would be basic and the strategy would be maintaining profitability; the owner would not need to be heavily involved. In contrast, for Stage III-G, the formal systems would be developing and the strategy would focus on getting resources for growth; the owner would continue to have high involvement. Only companies selecting and thriving through Stage III-G would move into Stage IV. Some make it through take-off and those who do not can sell or re-trench. Similarly, companies reaching maturity may continue operations, sell, merge or retrench. A successful Stage V company has achieved competitive advantages of scale and depth of talent. The researchers warned, “If it can preserve its entrepreneurial spirit, it will be a formidable force in the market” (p. 40). Otherwise, there is a Stage VI: Ossification with low innovation in decision making and delayed sensing of changing business conditions.

The researchers describe the variety of management factors that shift in degree of importance across the stages. The owner’s ability to master the dynamics of each stage requires flexibility. Common hurdles are learning to delegate and facing the need to change strategies. “Holding onto old strategies and old ways ill serves a company that is entering the growth stages and can even be fatal” (p. 49). As a company moves from Stage III-Growth to Stage IV-Take-off, the challenges intensify as every factor, except the owner’s “ability to do” increases in importance and the need for diversity of people,
adequate systems, and sufficient cash are crucial. With the higher stakes and bigger pay-offs come higher complexity and challenge.

**Growing in the mid-market.** Deloitte, a leading accounting and consulting firm, recently published its fourth report on Mid-Market Perspectives. The fourth in a series, this report’s subtitle was *America’s economic engine – why entrepreneurs matter* (2012). All reports in this series shared the same premise:

…while investors, the media, and the public focus disproportionately on startup companies and large, publically traded organizations, the thousands of companies that make up the middle market are critically important in terms of economic activity and job creation. Given their contribution to the U.S. economy, these companies – defined as those with annual revenues between $50 million and $1 billion – deserve move visibility that they get (p. 4).

In this fourth report, the population expanded into smaller businesses with annual revenues starting at $10 million. The rationale for focusing on entrepreneurs as “America’s engine” was explained as the need to support the behaviors necessary for activities of product development, technology leveraging, and market expansion – all necessary for growth. Some grow at a steady and solid pace and others explode to the S&P 50 but there are key “common characteristics, including job creation, adaptability, and innovation” (p. 2).

The 2012 report was based on two research efforts: a broad quantitative survey of 652 leaders and qualitative interviews with seven companies. Market research firm OnResearch completed the survey in September 2012. The 652 respondents were
executive leaders representing several types of positions (42% were owners, board members or C-suite executives). One quarter of the firms surveyed had revenues $10 million to $50 million and the remanding 75% had revenues between $50 million and $1 billion. All had U.S. headquarters, spread across 47 states. Respondent ages were distributed (not evenly) and gender mix was 28% female. The current CEO was the founder in 28% cases. Privately-held companies constituted 80% (20% were public). A wide range of industries were represented.

The survey questions assessed respondent’s views of their organization’s entrepreneurism, strategic priorities, company metrics (recent performance and short-term expectations) and actions since onset of recession in 2008. Questions gathered degrees of agreement on U.S. economic environment as supportive of entrepreneurial companies using a Likert scale. Respondents were also asked to indicate their opinions of the business environment as related to current sentiment and uncertainty using measures such as mindshare scores (multipliers were used to give weightings for respondents’ rankings). Finally, financial aspects were gathered regarding financing mix, cash considerations, and costs of regulatory compliance. There were opportunities for open-ended questions (e.g., what aspects of entrepreneurialism could most benefit their company). Descriptions of data collection and analysis methods were not provided. Results for survey questions and four case studies were shared.

The results strongly indicated the presence of and need for innovation and the entrepreneurial spirit. The majority (59%) of the participants saw the United States as “the world’s most accommodating country for entrepreneurs” (p. 2). When asked for a rank of the top three priorities in terms of business strategies, the highest (in mindshare)
was “organic growth in existing markets” and the third was “introducing new products and services” (p. 13). This focus was a noteworthy change from the prior year’s top strategic priority was “growth through acquisition.” When asked “What aspects of entrepreneurship do you think are the most important to help companies be successful?” the most frequent response was about growing through innovation and creativity “to create entirely new businesses, enhance existing products and services, and discover and penetrate new markets” (p. 4).

Most respondents (80%) believed any company of any size can behave in entrepreneurial ways, yet most (almost 60%) perceived “the complexity of large companies makes it difficult for individuals to be entrepreneurial” (p. 30). In the mid-market, company size seems to be a factor in entrepreneurial behavior as well. “Forty-four percent executives from the small companies said that their companies had become more entrepreneurial since they joined; only 32 percent of the executives from larger companies agreed with that statement” (p. 5). Efforts to drive a more entrepreneurial culture were cited to be (in descending order): communications, organizational structure, formal or informal incentives encouraging entrepreneurial behavior, tone from the C-suite, governance practices that allow entrepreneurial courses of action, and other. The main goals of entrepreneurial actions were: innovate around existing products or services (40%); discover and penetrate new markets (24%); enter or create new businesses (20%); and enhance capabilities in distribution, supply chain or other operational areas (15%).

Summarized results were related to lessons for mid-sized companies:
Entrepreneurial behavior matters. “Those organizations that consider themselves more entrepreneurial outperformed the others across a variety of metrics, often by a substantial margin” (p. 18).

People count. “A dedicated and committed workforce was cited as the greatest contributor to the success of companies in our survey” (p. 18). Many respondents were focusing on flatter hierarchies and greater potential for employee engagement and autonomy.

Uncertainty must not paralyze. Regulatory, political, economic uncertainty was higher than the prior year. One respondent shared that new investments seemed riskier and it was “harder to reach a consensus on expansion as opposed to hunkering down” (p. 7). Yet, mid-sized companies were taking action for growth as well as taking prudent financial behavior such as stock piling cash.

Senior Leadership Perspectives

As research grew on the ambidextrous organization, fueled by unprecedented forces of change, senior leaders began to demand specifics of how to lead ambidextrously. Evidence was mounting on the challenges and perils of sustaining ambidexterity, particularly how to prevent the strength of one from destroying the other. Proclamations and organization charts were insufficient. Strong argument were forming that ambidexterity was not something that senior leaders could decide once, delegate, and then monitor.

Ambidexterity as a piece of dynamic capability. Senior leaders are navigating intensifying forces and unexpected disruptions. Increasingly, organizations attempting to
sustain strategic competitive advantages through excellent execution with current organizational capabilities stumble when confronting game-changing events and disruptive entrants. O’Reilly and Tushman (2008) intensely examined the debate on whether organizations could resolve Christensen’s “innovator’s dilemma” (1997) and survive the forces of Schumpeter’s “creative destruction” (1934). They responded that ambidexterity could provide resolution if created and managed as a dynamic capability. They gave credit to organizational capabilities for providing competitive advantage and being difficult to imitate given the embedded routines, structures, processes, cultures, and senior leaders’ thinking and behaviors. They looked to senior leadership to nurture and refine organizational capabilities while also being “prepared to reconfigure these assets as contexts shift” (p. 188). They charged senior leaders with expanding in three areas: sensing through promotion of learning to learn, supporting new approaches and associated failures, and integrating knowledge transfer; seizing opportunities through strategic vision and action; and reconfiguring to “reallocate resources away from mature and declining businesses toward emerging growth opportunities” (p. 191). Mastering these skills creates “dynamic capabilities,” providing a setting for ambidexterity to flourish. To be meaningful, however, this dynamic capability must be translated into “specific senior team behaviors and organizational processes/routines that allow firms to manipulate resources into new value creating strategies” (p. 196). O’Reilly and Tushman drew a distinction in their definition of “ambidexterity” - “the specific capability embodied in senior leadership’s learning and expressed through their ability to reconfigure existing organizational assets and competencies in a repeatable way to adapt to changing circumstances” (p. 200). The attribute of being repeatable transforms
ambidexterity into a dynamic capability. They described five propositions for putting ambidexterity in action:

1. The presence of a compelling strategic intent that justifies the importance of both exploitation and exploration increases the likelihood of ambidexterity.

2. The articulation of a common vision and values that provide for a common identity increase the likelihood of ambidexterity.

3. A clear consensus among the senior team about the unit’s strategy, relentless communication of this strategy, and a common-fate incentive system increases the likelihood of ambidexterity.

4. Separate aligned organizational architectures (business models, competencies, incentives, metrics, and cultures) for explore and exploit subunits and targeted integration increase the likelihood of successful ambidexterity.

5. Senior leadership that tolerates the contradictions of multiple alignments and is able to resolve the tensions that ensue increases the likelihood ambidexterity.

Three years later, O’Reilly and Tushman (2011) published results of an empirical study aimed at answering questions about how to achieve dynamic capability and ambidexterity, an area they acknowledged as in its early stages of research. They recognized the missing pieces: specific management actions that facilitate simultaneous pursuit of exploitation and exploration, core leadership mechanisms underlying dynamic capabilities, and micro-mechanisms with sufficient granularity to be useful for guidance. Their research study consisted of fifteen case studies in firms attempting ambidexterity with a mix of results. Eight of the fifteen efforts had been successful in their efforts;
three had failed; and four began as underachieving but turned the efforts into success. They conducted semi-structured interviews with senior managers. The firms operated in differing industries and had been facing disparate problems. The study results showed the extent that each company had implemented each of the five propositions. Linkages between compliance with the propositions and success or failure were evident for four of the five propositions. The exception was the first which called for a compelling strategic intent that justifies both exploration and exploitation. O’Reilly and Tushman posited that “while possibly helpful, a clear strategic intent may not be a necessary condition for executing ambidextrous designs” (p. 15). The findings indicated that leader behavior and senior team composition deserves as much consideration as do resource allocation and organizational architectures.

**Embracing the tension.** In their article, *The Ambidextrous CEO*, Tushman, Smith, and Binns (2011) evaluated top management teams in twelve major companies. They identified recipes for failure and created suggestions for success. They observed the common error of delegating resource decisions, trade-offs and evaluations to business units where core operations were located. As a result, tensions and profit shortfalls were resolved in favor of the established business. Also performance was measured in traditional terms which too often declared efforts to be failures pre-maturely. Building on extensive knowledge of ambidexterity and observations of best practices in this research, Tushman and colleagues presented three principles to provide interventions that would protect and support renewal initiatives for the top leaders, the “C-suite.” The leaders are challenged to expand the identity to provide room for renewal and be aspirational for all to move to the future. Holding the tension at the top for constant conflict and debate
keeps the trade-offs between current capabilities and future possibilities at the strategic level to avoid operational priorities from over-riding newer efforts. In fact, innovation leaders must have proximity to the senior leadership team rather than working through traditional channels. Finally, senior leaders must model the way by “embracing inconsistency” (p. 79), including measuring and rewarding innovation efforts with distinct criteria with different time horizons. Senior leaders must hold the paradox, shifting resources (capital and top talent). “Their capacity for taking advantage of the opposing objectives, needs, and constraints of core businesses and innovation units enables them to deliver extraordinary performance, time and again” (p. 80). Two approaches were presented for CEOs to share the challenges: hub-and-spoke teams and ring teams. The requirements of an ambidextrous CEO clearly demand reframing and new methods.

**Innovation Strengths Preference Indicator®**

“Organizations don’t innovate, people do” is the wisdom frequently shared by Bob Rosenfeld, founder of Idea Connection Systems (ICS) and co-creator of the Innovation Strengths Preference Indicator® (ISPI™). Bob Rosenfeld is the founder of Idea Connection Systems, Inc. (ICS), formed in 1988 as a consulting firm “dedicated to helping organizations make innovation happen through people” (company literature, 2011). ICS focuses on three areas: innovation leadership and culture, innovation inclusion by leveraging differences, and innovation systems.

The ISPI™ supports the Leverage Differences pillar of the “Innovation House” (Rosenfeld & Wilhelmi, 2011) described in Chapter 1. To Leverage Differences, the hidden must be revealed, or in Rosenfeld and colleagues’ language, the invisible must be
made visible, The intended purpose was to describe people’s predispositions for approaching innovation including how they like to innovate and work with others when their efforts. The ISPI™ was developed with the belief that innovation leaders must be effective in communicating across the range of innovation orientations. Identifying and valuing differences among people permits leaders to leverage them (Rosenfeld & Wilhelmi, 2011). Leaders must also be self-aware of their own innovation preferences, particularly if they strive to “lead ambidextrously.”

Rosenfeld has dedicated decades to helping organizations and the people who work there understand the less visible pieces that come from the brain’s cognitive, affective and conative functions. Rosenfeld created the ISPI™ taking advantage of proven theory bases and integrating them into one indicator. The ISPI™ looks at the brain functions utilizing the insights of leading experts and instruments. (Summarized in Table 2.4)

Prior to the ISPI™, the creators had faced frustration with the host of available tools and instruments. The difficulties were that an integrated picture for feedback demanded extensive synthesis of several tools and that relating findings to innovation required significant interpretation. The ISPI™ provides feedback describing how a person prefers to innovate (Innovation Orientation - iO™) and how a person prefers to innovate with others (Innovation Orientation Modifiers - iOM™). The report shows placements along twelve orientations (given approximately 38,000,000 possible combinations, an individual’s profile is like a “personal innovation fingerprint”). These orientations can be viewed in relation to the Innovation Continuum™ when considering the natural fit for innovation preferences. (Appendices D, E, and F)
### Table 2.4.

**ISPI™ - Functions, Contributing Theory and Instruments (Rosenfeld & Wilhelmi, 2011; ICS company materials)**

<table>
<thead>
<tr>
<th>Functions of the brain</th>
<th>Leading theorists and theories</th>
<th>Instruments</th>
</tr>
</thead>
</table>
| Cognitive (Latin cognoscere “to know”) – how take in information and make meaning, apply knowledge to make decisions and solve problems | • Carl Jung’s theory of mental functioning.  
• Michael Kirton’s theory of creative problem solving. | • Myers Briggs Type Indicator (MBTI)  
• Kirton Adaption-Innovation Inventory (KAI) |
| Affective (Latin affectus, afficere) – externally displayed mood, how express needs | • William Shutz (further developed by Adorno, Fromm and Bion). | • Fundamental Interpersonal Relations Behavior (FIRO-B) |
| Conative (Latin conari “to attempt”) – how instinctively behave | • Kathy Kolbe | • Kolbe A™ Index |

Feedback locates an individual on a continuum from Builders (B) to Pioneers (P). Simply described, Builders would naturally prefer projects that are incremental or expansionary. Pioneers would be most comfortable in breakthrough projects. In between are Bridgers who have a general preference for either building (Mid-range Builders, MB) or pioneering (Mid-range Pioneers, MP). Bridgers (MB and MP) are very helpful to organizations with their ability to assist: Pioneers in linking innovation to the existing organization for greater success in implementation, Builders in reaching for greater degrees of innovation, and Pioneers and Builders in working together more effectively.

Since its creation in 2008, over 11,000 people have taken the ISPI™. Face validity is 98%. Latest research showed convergent validity with MBTI and FIRO-B to indicate similar theoretical background and showed significant correlations (MBTI and corresponding factor, Rs ranged from .53 to .70 at .01 level; FIRO-B and corresponding...
factors, Rs ranges from .50 to .70 at .05-.01 levels). There is a strong overall correlation between the Overall iO (a weighted average of the components) and Total KAI (R=.76); in general, both are measuring similar concepts within Adaption-Innovation theory.

David Horth, Senior Enterprise Associate at the Center of Creative Leadership (CCL) in North Carolina summarized CCL’s experience with the ISPI™ (personal conversation, April 2012). He related that, after extensive evaluation and certification effort, CCL approved use of the ISPI™ in leadership workshops and now trains others in its use. With expertise in creativity and innovation, Horth has published books on leading change, co-designed CCL’s Navigating Complex Challenges (a twelve-week process for senior leaders), and led ISPI™ certification competency at CCL.

Amanda Lang, award-winning senior business correspondent of CBC News, researched the ISPI™ by taking the indicator and interviewing a group of senior psychologists who had been certified on the tool and intend to incorporate its use in their practices. She related her findings to the areas of curiosity and innovation in her book The Power of Why (2012). She noted the power of the ISPI™ in looking at how one approaches problems and implementing change and especially in understanding frictions.

“Recognizing that we all approach problems differently can help you to be more patient and empathetic, and will probably help everyone reach a solution faster. And it also helps to recognize the incredible value of being exposed to different ways of thinking, whether they were acquired living abroad or living right next door” (p. 209).

Lang recognized that people innovate differently with personal preferences along a spectrum of innovation from incremental to radical and submitted that everyone has
latent curiosity that can be awakened. Her motivation in exploring curiosity was to identify ways to ignite the innovation instincts of many individuals to make a collective difference for Canada.

The U.S. Department of Defense (DOD) has been using the ISPI™ extensively in assigning people into foreign cultures (personal conversations with ICS leaders). In 2010, the Ministry of Defense Advisors (MODA) used the ISPI™ to validate selection decisions of seven groups of civilian workers who would be sent overseas to serve in positions of high contact and influence, “working in theater” on constructs for peace. The ISPI™ verified the presence of the attributes necessary for leadership in these roles such as being visionary and a strong preference for relationships. Now, the ISPI™ is part of the selection process (personal conversation with Ryan Ewers, ICS Statistician and ISPI™ product manager, January 2012). The Civilian Expedition Workforce (CEW) is also using the ISPI™ to make placement decisions to identify people who have the preference for working on concrete assignments such as material procurement and a predisposition to interface with diverse types of people such as those who would be in the local community. The DOD has been creating environments for understanding of cultural differences and using the ISPI™ as a learning module. By understanding the differential components of culture, they will be able to identify regional preferences and apply insights to selecting, developing, and coaching advisors sent to those regions. Additionally, the DOD is exploring the effects of extreme stress on its forces by administering the instrument before and after high-risk assignments. Major changes may indicate the areas for focus of healing efforts.
Research of the ISPI™ continues in the area of entrepreneurship. A well-known Eastern business school asked its 2010-2011 first year students to take the ISPI™ (on a volunteer basis) prior to participating in its business plan contest. The results of the contest were analyzed along with the orientations of the individuals with a focus on the cognitive diversity in the winning team. Further, development efforts at ICS are using the ISPI™ to understand the dynamics of stage-two entrepreneurs in order to define archetypes for building companies.

Chapter Summary

The literature review was a comprehensive exploration of studies related to implementation and organizational capabilities necessary for sustained innovation. To investigate the difficulties and “de-railers” preventing innovation from fulfilling its promise, the review began with organizational context. Studies showed that innovation efforts had been, in essence, “illegitimate” within the organizations, and faced a host of “anti-innovation dynamics.” Successes were single events. Research findings called senior leaders to build organizational meaning and capabilities for innovation in order to empower the innovators and create the repeatability necessary for sustained innovation.

Another lens for understanding innovation implementation was a conceptual model that captured aspects of implementation climate and considered fit between the innovation and the organization’s values. One study tested each linkage in the model at the level of the individual and showed each factor had a positive relationship with implementation effectiveness. The implication for senior leaders was the importance of attending to aspects and systems associated with supporting human efforts and values.
Common themes began to emerge regarding the issues and remedies. Strong voices pointed to lack of organizational readiness for implementing radical or breakthrough innovation. Traditional practices of execution have proven to be ineffective. A distinct set of organizational capabilities will be essential to implementing innovation. Deliberate efforts are necessary to create and support the duality and the associated paradoxes.

Mention of “dual structure” and study of “ambidexterity” have grown significantly in the past decade. Ambidexterity’s essence is balancing the tensions between exploiting today’s capabilities to meet immediate survival and exploring future opportunities to ensure long-term viability. One research study illuminated the potential of managing the paradoxes for enabling adaption, change, and renewal. Lessons for leadership emphasized managing the paradoxes deliberately with a new paradigm that extends leadership to all and considers “and/both” thinking. Separately, theoretical research unpacked organizational ambidexterity into two dimensions (balancing exploitation efforts and exploration efforts, maximizing the combined magnitude) and evaluated the effects of environmental munificence and organization size. A subsequent empirical study tested the unpacking framework and showed that critical components of ambidexterity affect SMEs’ outcomes differently than those of large firms and that SMEs would be well advised to seek close balance between exploration and exploitation efforts. Study of ambidexterity at the individual manager level linked the presence of certain dynamics (i.e., authority, cross-functional interfaces) to ambidexterity.

Efforts to understand SMEs led to literature on organizational development and reports on growth in the mid-market segment. SMEs face particular challenges in the “in-
between” beyond startup (existence and survival) and through growth to take-off. If they are to create organizations, owners must master the shifting management factors through the varying dynamics of each stage. In the aggregate, success of SMEs and the entrepreneurs who fuel their growth are critical to the United States’ economic engine and deserve greater visibility. Lessons to companies emphasized: the importance of sustained entrepreneurial behaviors; dedicated and committed workforces; and an orientation to action, despite pressing external uncertainties.

Senior leaders have the charge and challenge of creating ambidexterity. They cannot leave the battles to the managers. The senior team must promote and protect the duality with specific management actions. Research showed essential efforts include: articulation of a common vision; consensus and relentless communication of the strategies with a common–fate incentive system; separate, aligned organizational architectures; and senior leadership’s tolerance of contractions and tensions. Mastering these skills creates “dynamic capabilities,” providing a setting for ambidexterity to flourish. By adapting to changing circumstances and discovering new value creating strategies, firms can survive innovative disruptors and creative destruction.

Just as “organizations don’t innovate, people do” (Rosenfeld & Wilhelmi, 2011), positions don’t lead, people do. The ISPI™ is a highly effective and proven tool for understanding – at the levels of individual innovators, innovation teams and leaders of innovation. Senior leaders bring their own preferences as well as have the charge of leveraging the strengths and preferences of their teams. Nurturing ambidexterity requires deliberate attention to matching people to tasks and aligning all efforts to the innovation intention.
Chapter 3: Research Design Methodology

Organizations of all sizes are responding to intensifying competitive forces and rapidly advancing technologies by making significant investments in innovation initiatives. Yet overall, the results of these efforts have been poor. After two decades of research and practice, successfully implementing innovation has shown challenges requiring efforts equal in magnitude to those of creating the innovation itself. Management practices themselves must be sufficiently innovative.

Organizations increasingly acknowledge the need for renewal to meet their changing marketplaces. Renewal frequently means radical innovation. Senior leaders face the paradoxes associated with exploiting current capabilities of satisfying customers and producing profits while continuously exploring future possibilities of unmet needs. They must stretch their collective leadership ability to expand the organization’s capabilities to respond to the exploit-and-explore duality. Many senior leaders are embracing this duality by pursuing ambidextrous leadership. Ambidexterity may entail distinct business models with different competencies, systems, incentives, processes and cultures—each internally aligned. Ambidexterity’s aim would be to advance an organization on its trajectory of innovation.

For a working definition, this research study turns to management icon Peter Drucker who stated in his often-cited and republished article, *The Discipline of Innovation* (1985), “innovation is the effort to create purposeful, focused change in an enterprise’s economic or social potential” (p.67). This research study will enter the realm
of innovation implementation from the perspective of senior leadership. In growing numbers, senior leaders are embracing their responsibility for the organization’s health and renewal by focusing on innovation success. They are seeking to master the key success factors necessary as they unite the idea, the innovation project leader, and organizational capabilities.

Innovation portfolios consist of projects that span from evolutionary to revolutionary. Rosenfeld and Wilhelmi (2011) created the Innovation Continuum™ to portray the expanse. (Appendix D) Evolutionary projects (continuous improvement) and product/market expansions perpetuate successful growth of current operations. Revolutionary projects are radical or breakthrough, including strategic innovations that pursue significant differences in customers, customer needs, or business processes of creating value (Govindarajan & Trimble, 2010). Evolutionary and revolutionary projects mandate distinct strategies, structures, processes, and cultures (O’Reilly & Tushman, 2004). To ensure success along the continuum, senior leadership must embrace paradoxes by “leading ambidextrously” (Tushman, Smith, & Binns, 2011).

The preponderance of research has studied innovation implementation in large established organizations. Recent research has extended thinking to implications for small and medium enterprises (SMEs) (Cao, Gedajlovic, & Zhang, 2009). Such research looks at efforts to exploit the evolutionary projects and to explore the revolutionary projects. It tests the impact on results of the absolute investment in both types of projects and the balance between projects on the two ends. The presence of balance, the researchers argue, is especially critical to results for SMEs. Because SMEs are resource-constrained compared to large organizations, balance is essential to mitigating risks.
Another influencing factor is “environmental munificence” which refers to the extent, from abundance to scarcity, that external resources are available to support growth (e.g., technological knowledge and industry information through external partnerships) (Cao et al., 2009, Dess & Beard, 1984; Keats & Hitt, 1988). The ability to access critical external resources readily may be especially important to SMEs, typically lacking excess funds or capacity to fuel growth. (Appendix B for Cao, et al.’s Model of the Two Dimensions of Organizational Ambidexterity).

Hidden below what senior leaders need to do for innovation is what senior leaders prefer to do, their innovation strengths and preferences. Like senior leaders of large organizations, SME leaders can become stretched beyond their preferences when initiating and managing projects across the Innovation Continuum™. In SMEs, however, the depth and breadth of leadership talent to draw upon is less. This invisible, but highly, relevant factor is typically overlooked in discussions regarding innovation.

This research study investigated the following questions:

1. Based on interviews, is there evidence of ambidextrous leadership in small and medium enterprises (SMEs)?

2. In seeking to advance an organization on its innovation trajectory, how do senior leaders of SMEs ensure the capabilities both for exploiting current innovation and continuously exploring future innovations?

3. How do the innovation orientations of SME leaders motivate innovation and its implementation as measured by the Innovation Strengths Preference Indicator® (ISPI™)?
The overall purpose of the study was to explore a relatively new area of research, implementing innovation with ambidextrous leadership, in a space that has previously received scarce attention - small and medium enterprises (SMEs). A carefully selected set of theories guided this investigation at the edge of “the known” and “the emerging.” To gain a deeper understanding of the participants, the research study utilized a tool designed for that purpose – how individuals prefer to innovate and work with others in innovation efforts. The tool generated positions along continuums in twelve orientations for each participant. A growing database of over 11,000 has been forming since the tool’s introduction in 2008, with 98% agreeing that the results describe them. In this research study, the tool was useful in explaining the participant’s individual aspects of leading innovation.

With a combination of explore and explain, this research study took on attributes of both qualitative and quantitative, or mixed methods (Creswell, 2009). Given that contact with each participant was designed to be only one interview and one brief follow-up phone conversation, data collection was concurrent. The primary method consisted of qualitative interviews. A secondary data source was the quantitative results of the ISPI™ instruments delivered to each participant the week prior to that interview. Because the insights from the quantitative tool formed a data set that further informed the results of the qualitative interviews, the quantitative was seen as embedded within the qualitative. “A concurrent embedded approach has a primary method that guides the project and a secondary database that provides a supporting role in the procedures” (Creswell, 2009, p. 214) as depicted in the graphic shown in Figure 3.1, adopted from Creswell’s descriptions (2009, p. 210):
Diverse strategies of data collection afforded an “unfolding method of inquiry” (Creswell, 2009, p. 173). The primary form of data collection was the interview conducted in a natural setting, the participant’s workplace, with the researcher as the key instrument. The interviews were one-on-one and semi-structured, using broad and general questions to allow construction of meaning through the complexity (Creswell, 2009). Other sources of data to inform the interview and subsequent analyses were the company’s mix of innovation projects underway and the participant’s innovation profile utilizing a well-tested indicator. Data analysis generated a cohesive set of themes. The researcher developed patterns of meaning inductively to deepen the understanding of the current dynamics.

Research Domain

This research study focused on a small set of seven small and medium enterprises (SMEs), in two medium-large metropolitan statistical areas (MSAs). To avoid regional bias, Rochester, New York and Charlotte, North Carolina represented the East and the South. The two cities have several factors that make them comparable. Each MSA is of a significant, but not huge, population size (Rochester about 1,000,000, Charlotte about 1,700,000 in 2011). Each once enjoyed the presence of a few business giants that defined
and provided for the region. Each now faces the challenge of rebuilding to compensate for the changing roles of those giants. SMEs have been playing a central role in each area’s recovery and redefinition. The Chambers of Commerce of both Rochester and Charlotte boast strength in manufacturing, health care, and energy. Both have ample entrepreneurial activity and innovation capability (Appendix A). Both have growing relationships with area universities. Both have incubators: High Tech Rochester and Charlotte’s Ventureprise.

**Research Participants**

This research study sought to investigate small and medium enterprises in their growth stage of organizational development. Initially, the profile parameters included: five to ten years old, 10-250 employees, profit over $5 million, and closely-held (not funded by venture capital). These parameters evolved through discussions with experts (described below). Headquarters were in the Rochester or Charlotte metropolitan areas. Other functions, including research and development, could reside outside the geographic target area.

The interviews were with two senior leaders who determine the business strategy and key innovation initiatives, set priorities, and make resource allocation decisions. Given the companies were SMEs, senior leadership as defined was expected to reside in the Chief Executive Officer (CEO) and the Chief Operating Officer (COO) or Chief Technology Officer (CTO). Demographics were collected to capture personal information regarding education level and field, age, longevity in organization, and innovation background (reported in Chapter 4).
All participants signed an informed consent agreement stating their involvement was voluntary. Confidentiality was assured by creating disguised company names and participant roles or codes, and evaluating distribution of investments by types of projects and time allocation rather than absolute dollars. Appreciation was expressed by providing participants with ISPITM results during the interviews and explanations and offering a brief research summary after completion.

**Procedures and Instruments**

**Participant selection using Delphi technique.** The Delphi technique was originally developed at RAND Corporation for the US Air Force in the early 1950s and expanded into commercial use and health care in the 1960s (Linstone & Turoff, 1975). A structured communication process allows disparate and geographically dispersed experts to provide opinions on a specific topic. Consensus is formed after multiple structured, anonymous rounds of data collection, typically with written correspondence or, more recently, computer-based responses. While a survey looks at what is, the Delphi technique assesses what could or should be (Hsu & Sandford, 2010). Olaf Helmer, an originator of the Delphi technique, reported the principal application was technological forecasting but use was also in many other contexts in which “judgmental information is indispensable” (Linstone & Turoff, 1975, p. xix). Applications were often in areas calling for measures not yet existing and “inventive planning.” The Delphi technique has provided a realistic method for accessing the “advice community.”

For purposeful selection in this research study, a simplified modified Delphi technique was employed to utilize experts’ opinions as a means of identifying companies
to investigate. Experts were formal and informal leaders from business, community, and research institutions (see Table 3.1).

Table 3.1

*Delphi Experts*

<table>
<thead>
<tr>
<th>Area</th>
<th>Expert</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rochester</td>
<td>A</td>
<td>Director of Innovocracy, Founder of Rochester Growth, Financial Adviser at Merrill Lynch</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>President &amp; CEO of Greater Rochester Enterprise (nonprofit regional economic development organization)</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Associate Provost and Director of Golisano Institute of Sustainability, Rochester Institute of Technology</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>President of High Tech of Rochester (non-profit catalyst for entrepreneurship and innovation-based economic development), Managing Director of Rochester Angel Network</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>Dean and Professor of Economics at Simon School of Business Administration, University of Rochester</td>
</tr>
<tr>
<td>Charlotte</td>
<td>F</td>
<td>Senior Enterprise Associate at the Center of Creative Leadership, Subject matter expert in organizational creativity.</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>Senior Faculty Member of Center of Creative Leadership, Subject matter expert in innovation.</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>President of Ventureprise (catalyst for entrepreneurial innovation, Ben Craig accelerator and incubator, funded by UNC Charlotte and client fees)</td>
</tr>
</tbody>
</table>

Delphi experts were familiar with area companies that have moved from startup to growth status. Conversations were face-to-face meetings. Instead of responding to an issue, experts received a description of the research study goals and a prepared profile of five to seven parameters describing target companies. They were asked to react to the profile and provide feedback to the list of parameters. They were also asked to interpret
the profile with suggestions of candidates (names of companies and top leaders) to approach for study

Since their names were used when approaching potential participants, each expert signed an informed consent form. After being told the Profile of Company Candidate was intended to “explain and not exclude,” experts provided feedback allowing the profile to evolve into a final version (Appendix G). The experts also offered suggestions of companies. One expert requested a one-page summary to send with his cover notes of introduction to those companies selected to approach (Appendix H). To determine which companies to select, extensive background research investigated company web sites, LinkedIn biographies and descriptions, and articles in local business journals. Each expert offered helpful insights to the company candidate profile specifically and the study in general. To express appreciation, each expert will receive a brief summary of the study following completion.

Through a combination of electronic correspondence and initial telephone meetings, leaders from seven companies agreed to participate. The companies were almost evenly divided, with three in the Rochester area and four in the Charlotte area

**Participant’s innovation profile as input to the interview.** In the days preceding the interview, each participant completed the Innovation Strengths Preference Indicator® (ISPI™). This quantitative method was secondary and answered different questions than the primary qualitative interview method. Participants answered 50 questions online, taking approximately fifteen minutes. During the last question of the interview, the researcher gave a brief description the participant’s ISPI profile. Questioning followed to identify the participant’s extent of agreement with the placement
as a Pioneer, Bridger, or Builder. At the end of the interview, participants received thirty-two page feedback reports with their personal results. The participants had a second opportunity to ask questions and offer reactions in the follow-up phone calls. The ISPI results and participants’ reactions informed the interviews and provided additional data for analysis, thereby serving as the quantitative embedded component of the overall approach.

The Innovation Strengths Preference Indicator ISPI was created to make visible important, but invisible, predispositions for approaching innovation, including how people like to innovate around problems and work with others. Bob Rosenfeld is the co-creator of the ISPI as well as the founder of Idea Connection Systems, Inc. (ICS), formed in 1988. ICS is a consulting firm “dedicated to helping organizations make innovation happen through people” (company literature, 2011). ICS focuses on three areas: innovation leadership and culture, innovation inclusion by leveraging differences, and innovation systems. The ISPI was developed with the belief that innovation leaders must be effective in communicating across the range of innovation orientations. Identifying and valuing differences among people permits leaders to leverage them (Rosenfeld & Wilhelmi, 2011). Leaders must also be self-aware in terms of their own innovation preferences, particularly if they strive to “lead ambidextrously.”

The ISPI creators developed this tool in response to their frustration with the host of available tools and instruments. In their work with leaders of innovation, they had been facing two difficulties: extensive synthesis of multiple tools was needed for an integrated picture and significant interpretation was required to relate the findings to innovation. The ISPI integrates tools that look at three major areas: cognitive (how I
think), affective (how I express my needs), and conative (how I instinctively behave).

Feedback shows how a person prefers to innovate (Innovation Orientation – iO™) and how a person prefers to innovate with others (Innovation Orientation Modifiers – iOM™). The results show an individual’s placements along twelve orientations (with approximately 38,000,000 possible combinations, an individual’s profile is like a “personal innovation fingerprint”). (Appendices E and F)

Feedback locates an individual on a continuum from Builders to Pioneers. People in the mid-range between Pioneers and Builders are called Bridgers. Simply described, Builders would naturally prefer projects that are incremental or expansionary. Pioneers would be most comfortable in breakthrough projects. In between are Bridgers who have a preference for either building or Pioneering. Bridgers are very helpful to organizations with their ability to assist those on the extremes, such as: Pioneers in linking innovation to the existing organization for greater success in implementation, Builders in reaching for greater degrees of innovation, and Pioneers and Builders to work together more effectively (Appendices E and F)

Since its creation in 2008, over 11,000 people have taken the ISPI™, with face validity of 98%. Latest research showed convergent validity with MBTI and FIRO-B to indicate similar theoretical background and showed significant correlations (MBTI and corresponding factor, Rs ranged from .53 to .70 at .01 level; FIRO-B and corresponding factors, Rs ranges from .50 to .70 at .05-.01 levels). There is a strong overall correlation between the Overall iO (a weighted average of the components) and Total KAI (R=.76); in general, both are measuring similar concepts within Adaption-Innovation theory.

David Horth, Senior Enterprise Associate at the Center of Creative Leadership (CCL)
summarized CCL’s experience with the ISPI™ (personal conversation, April 2012). He related that, after extensive evaluation and certification effort, CCL approved use of the ISPI™ in leadership workshops and now trains others in its use.

A grant was obtained from Innovation Connection Systems to cover the fees for the ISPI™ instruments. Participants were not asked to pay for taking the ISPI™ (normally $75 each) nor any fees for discussing the results. The researcher administered the ISPI™ prior to the interviews. Discussion of the results occurred in the last portion of the interview and in a brief telephone conversation two-to-four weeks following the interview. The researcher was certified for such ISPI™ reviews. The ISPI™ findings informed the discussion. The aggregate ISPI™ results of the research study’s participant pool were compared with ICS’s aggregate ISPI™ database to provide a context for interpretation.

**One-on-one interviews.** There were two semi-structured interviews in each organization. The primary person, the CEO in six of the seven companies, was asked to select the second participant who was a partner in innovation, such as the COO or CTO. The interviews were one-on-one and ran approximately 90 minutes. Results of the ISPI™ were interpreted and discussed with the participants during the interview. One-on-one interviews provided information on the history of the company, environmental supports and obstacles, the products that made for success and demanded ongoing maintenance and improvement, and efforts to explore the “next big idea.” The interviews also covered how leaders manage both types of efforts and the associated challenges (personally and organizationally).
The researcher developed an interview guide. She asked for feedback from three senior leaders with extensive distinguished experience (combined over 120 years as Fortune 100 practitioners, executives, and consultants in business and academic arenas). In addition to common strengths in strategy and change leadership, each brought distinctive perspectives in marketing, engineering, and research across a wide range of industries. (Table 3.2)

Table 3.2

Senior Leaders Providing Feedback on Interview Guide

<table>
<thead>
<tr>
<th>Senior Leaders</th>
<th>Experience Relevant to Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>30 years of consulting experience with senior executives and their management teams. Clients ranging from Fortune 500 to mid-size organizations and nonprofits. Today conducts consulting and teaching practice as a partner at the Barcelona-based Globalpraxis. Author, speaker, and visiting lecturer.</td>
</tr>
<tr>
<td>B</td>
<td>Founder &amp; CEO of Idea Connection Systems, a consulting firm dedicated to helping organizations make innovation happen through people. Co-creator of ISPI™. Innovator in Residence at Center of Creative Leadership. Founder of first Office of Innovation at Eastman Kodak. Author and scientific researcher.</td>
</tr>
<tr>
<td>C</td>
<td>Consultant. 30 years leadership of R&amp;D and engineering groups in General Electric and United Technologies (GE Chief Engineer, Senior VP). Rochester Institute of Technology, Director of Center for Manufacturing Studies, VP for Academic Affairs and Distinguished Lecturer. Researcher and speaker.</td>
</tr>
</tbody>
</table>

The interview guide (Appendix I) provided direction and techniques for inquiry. Three interview aids were utilized. The first was a modification of a technique suggested by Govindarajan and Trimble (2011) for senior leaders to discern the need for additional effort in radical innovation. This technique offered the advantages of simplicity (index cards) and visual impact (card sort to reveal project mix’s balance or imbalance). Another aid was use of a diversification matrix, widely in business strategy. Ansoff (1957, 1965)
developed this matrix and assigned four main growth strategies to each quadrant. It is known as Ansoff’s Growth Vector Matrix or Product-Market Matrix. (Matrix shown as part of Interview Guide in Appendix I, permission granted in Appendix J).

Ansoff’s Product-Market Matrix depicts combinations of existing products and names the associated four product-market strategies. These combinations and strategies map well with the Innovation Continuum™. For instance, the new-product/new-market combination requires a diversification strategy; that would be the location for projects described as breakthrough or radical. A diversification strategy mandates new skills, organizational capabilities, and approaches –congruent with strategic innovation theory. In contrast, the existing-product/existing-market would dictate a market penetration strategy and would likely be described as continuous or incremental innovation efforts. Similarly, new-product/existing-market would motivate a product development strategy and an existing-product/new-market would motivate a market development strategy; both would motivate expansion innovation efforts. The participants were handed a copy of the matrix as a visual aid to assist the team in categorizing their efforts on behalf of incremental, expansive or breakthrough. As a third aid, selected charts from the ISPI™ feedback report supported the brief description of the participant’s orientations. These summary comments provided a basis for the participant to react to the overall description and link the personal innovation preferences with the company’s innovation efforts. Thereby, ambidexterity and innovation leadership of innovation and leadership were taken to the individual level (as a leader and as a part of the senior team).

Follow-up phone conversation (ranging 15 minutes to an hour) provided opportunities for clarifying questions and to participants to raise questions having
reviewed the ISPI™ feedback reports. The semi-structured interviews were audiotaped and transcribed. Interview summaries (two to four pages each) were sent as a means of member checking. All participants sent responses, ranging from complete agreement to additional comments in e-mails, to markups on the document.

**Data Analysis**

The research employed a spiral data analysis (Creswell, 2007). Rather than following a straight path reducing data into results, the analysis followed analytical circles of data management, organization, and interpretation (see Figure 3.2).

![The Data Analysis Spiral](image)

*Figure 3.2. The Data Analysis Spiral (Creswell, 2007).*

As a concurrent embedded mixed method design, the qualitative interview data (primary) were informed by the results of the ISPI™ (secondary), the supporting data set. The data resided “side by side as two different pictures that provide an overall composite
assessment” (Creswell, 2007, p. 214) and afforded “perspectives from the different types of data” (p. 215). For the quantitative, ISPI™ results were computer-generated using proprietary algorithms and summarized in a 32-page report given to the participants. Over the course of three sessions, the ICS Statistician and ISPI™ Product Manager provided guidance on approach, training on creating reports, review of the early analyses, and a final review of the quantitative results.

Qualitative content analysis was used to reduce the data set and transform it into findings. Increasingly, researchers in the field of management researchers have been using content analysis effectively to “leverage the conceptual and analytical flexibility afforded by the method to yield studies mixing inductive and deductive approaches based on rigorous quantitative analysis as well as rich qualitative insight” (Duriau, Reger, & Pfarrer, 2007, p. 23). The process of “emergent coding” (Stemler, 2001) helped to create categories of the data for insights and support the evolving nature of the research. Directed content analysis provided deductive direction in answering research question one. Conventional content analysis provided inductive guidance in answering research question two.

The coding process was guided by Creswell (2009) and started by dividing the interview text into chunks and labeling with paraphrases, phrases, and paragraphs “in the actual language of the participant (called an in vivo term)” (p. 186). After review of the transcripts and recordings, interview summaries (two to four pages each) were sent to each participant to get feedback on the observations, as a member check (100% response rate). The summaries served as the basis for creating codes. Codes were the units of data selected for that question and copied onto Post-It® Notes (each company a different
These Post-It® Notes were affixed onto a tri-fold poster board, grouped by participants and companies for the next steps of analysis. The work began independently in selecting and forming the codes onto the Post-It® Notes. To enhance reliability, an associate with expertise in conceptual analysis, as well as executive leadership, was enlisted. He assisted in evaluating codes against criteria, grouping codes into themes. Methods to ensure inter-rater reliability were devised during both directed and conventional content analyses.

Following the guidance of Creswell and Plano Clark (2011), the mixed methods interpretation involved “looking across the quantitative results and the qualitative findings and making an assessment of how the information addresses the mixed methods question in a study” (p. 212). Beyond interpretations drawn from the qualitative and quantitative strands called “inferences,” this mixed methods analysis relied on “meta-inferences,” interpretations made from across the qualitative and quantitative strands (Creswell and Plano Clark, 2011). These meta-inferences answered research question three and enriched the overall findings.

Compilation of these data forms provided a holistic picture. The researcher synthesized interview themes, observations regarding innovation project balance, ISPI™ results as related to leaders’ priorities, and leaders’ impressions of environmental munificence. Participants had the opportunity to respond with additions and corrections.

**Limitations**

The researcher was the lens and interpretation was likely influenced affected by her experiences in general management and innovation in large established businesses, which had commonalities and significant differences with the companies in the research.
study. She was candid and forthcoming throughout the study about background and potential biases that could factor in interpreting data, identifying themes and communicating results.

Creswell (2009) noted a limitation with the concurrent embedded strategy: “The data need to be transformed in some way so that they can be integrated within the analysis phase of the research (p. 215). Discrepancies require resolution and the unequal priority can produce “unequal evidence.” Interpreting the results was challenging.

The ISPI™ was created by expert practitioners in the field of innovation. The co-creator, Bob Rosenfeld, is the founder of Idea Connection Systems which is a for-profit consultancy working with clients in industry, government, medical counseling, and non-profit organizations. With its roots in practical applications, the ISPI™ had not undergone strict psychometric testing. Its application has been largely in business settings and has achieved 98% face validity. Given that business has a history of teaching methods and embracing best practices and that theory is a relative newcomer to the field of business, tools often achieve usefulness before gaining rigorous statistical proof. Christensen (2004) wrote of making “laps around the theory-building track,” noting that currently innovation theory is between experimentation and science. Similarly, tools to describe the innovators themselves are in the formation stage. That the ISPI™ has high convergence with commonly accepted tools (MBTI, FIRO-B, and KAI) provided sufficient confidence in its use in a supporting role to further inform the semi-structured interviews in this research study.
Chapter Summary

This research study investigated the existence of ambidextrous leadership in small and medium enterprises (SME). It also explored how senior leaders of SMEs advance their organizations along innovation trajectories. The study observed how the senior leaders match their strengths and preferences to the organizations’ innovation efforts. The research was a concurrent embedded design with qualitative interviews informed by results from the ISPI™, a quantitative tool. Purposeful sampling used a simplified modified Delphi technique to locate participants. Rich data were collected, primarily through semi-structured interviews in natural settings. The interviews were informed by results of a tool that indicated individuals’ strengths and preferences as related to innovating. An integrated summary was sent to the participants as a form of member checking. A spiral data analysis using content analyses aided in identifying categories and key themes. This holistic approach provided insight into the challenges of sustained innovation and approaches to “leading ambidextrously.”
Chapter 4: Analyses and Results

Introduction

Leading an organization requires making strategic choices and building capabilities to seize the opportunities of the future. To face intensifying competitive forces and rapidly advancing technologies, senior leaders must sense and seize opportunities on the horizon while simultaneously fulfilling current promises to customers, employees, financers and other constituents. This duality introduces the need to lead in paradox. Many senior leaders are embracing this duality by pursuing ambidextrous leadership. In large organizations, efforts to achieve ambidexterity have entailed distinct business models with different competencies, systems, incentives, processes and cultures – each internally aligned – and connected by linking systems. Senior leaders have been advised to hold the tension of the paradox at the top in making decisions about resource allocation and configurations. Ambidexterity’s aim is to advance an organization on its trajectory of innovation so the organization can renew itself and endure turbulent times. Senior leaders of small and medium companies as well as large face the dilemma of “the right” balance of energies and resources between maintaining current profitability and ensuring future relevance. Ambidexterity acknowledges addressing the leadership dilemma is like playing two games simultaneously.

The purpose of the research study is three-fold. The first area was to inquire as to the presence of ambidextrous leadership in small and medium enterprises. The second
area will be to identify how senior leaders of small and medium enterprises, having survived the startup stage, succeed in the growth stage, while advancing innovation. The third area will investigate how they balance the seemingly conflicting leadership roles of innovation for today’s business and for future renewal, given their individual innovation orientations. This research study will investigate the following questions:

1. Based on interviews, is there evidence of ambidextrous leadership in small and medium enterprises (SMEs)?
2. In seeking to advance an organization on its innovation trajectory, how do senior leaders of SMEs ensure the capabilities both for exploiting current innovation and continuously exploring future innovations?
3. How do the innovation orientations of SME leaders motivate innovation and its implementation as measured by the Innovation Strengths Preference Indicator® (ISPI™)?

This chapter describes the data collection effort and reviews the data analysis. It is centered on the research study’s participants, the fourteen leaders of the selected SMEs. It begins by describing the efforts to locate and engage the fourteen participants and their demographics. Using a concurrent embedded mixed-method design, the research study has three components: qualitative, quantitative and mixed (Creswell, 2009). The mixed method design fulfilled the need to enhance the study with a second method; the embedded design permitted the supplemental quantitative data to improve the larger qualitative design (Creswell & Plano Clark, 2011). Seeking to both explain and explore, the research study used this mixed method design for greater completeness and credibility.
This chapter has five sections. The first section reviews the method to identify the participants and their demographics. The quantitative section, the second section, consists of an in-depth summary of the results of the Innovation Strengths Preferences Indicator® (ISPI). Interpretation used a lens considering innovation and implementation in entrepreneurial companies having survived startup and moved into the growth phase. Individual results of the two participants in each company are compared with discussion of potential implications of their shared leadership profiles. The qualitative section follows, describing the results of content analysis for the first two research questions. In the fourth section, the mixing analysis addresses the third research question. The final section, a summary of results, concludes the chapter.

Participants and Demographics

A simplified modified Delphi approach focused and refined the profile of company candidates and led to potential participants. The Delphi experts were provided a summary of the study’s purpose and the latest version of the company profile. They were advised the profile was intended to “explain and not exclude” companies. There were several variations based upon the input of the experts. For example, the Delphi experts advised relaxing the age criterion since the time required to survive startup ranges widely (explaining the plus in the profile, 5-10+ years of company age). The profile evolved into its final form (Table 4.1).
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
<td>Stage III – Success Growth (post both Stage I Survival and</td>
</tr>
<tr>
<td></td>
<td>Stage II Existence/pre-mature, Churchill &amp; Lewis, 1997)</td>
</tr>
<tr>
<td>Intention</td>
<td>Build successful enduring company</td>
</tr>
<tr>
<td>Age</td>
<td>Min. 5 years (5 – 10+ years)</td>
</tr>
<tr>
<td>Size: # Employees</td>
<td>50 -250</td>
</tr>
<tr>
<td>Profits</td>
<td>“Sustainably profitable”</td>
</tr>
<tr>
<td>Business</td>
<td>Technology-oriented</td>
</tr>
<tr>
<td>Location</td>
<td>Headquarters in Greater Rochester/Charlotte area (MSA)</td>
</tr>
</tbody>
</table>

The Delphi study discussions also led to potential participants. Each expert provided names for consideration which were vetted using exhaustive Internet searches. The companies met the profile with two noteworthy variances in number of employees (discussed below). Having reduced the possibilities to target companies, one expert in each region offered to send electronic messages to the companies’ leaders introducing the study’s purpose and the researcher’s background and requesting that they consider participating. Through a combination of electronic correspondence and initial telephone meetings, leaders from seven companies in the Rochester and Charlotte areas agreed to participate.

The participating companies, all technology-oriented, varied in the ways they utilized technology to define and shape their businesses. The companies were founded
between 1990 and 2006. At the time of data collection, company ages averaged 15 years and ranged between 7 and 23 years: one under 10 years, twelve between 10 and 20 years, and one over 20 years. Five of the seven companies had between 50 and 250 employees. One variance was one company (previously over 100 employees) that had reconfigured to a new model of a “virtual organization” with a core group (11 full-time employees) and hundreds of contracted employee relationship. The second variance was a company with 350 employees, many necessary to meet the extensive customer support requirements of its business model (see Table 4.2).

Table 4.2

<table>
<thead>
<tr>
<th>Companies Agreeing to Participate in Research Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company age (Yrs.)</td>
</tr>
<tr>
<td>Employees (No.)</td>
</tr>
<tr>
<td>Technology-oriented business</td>
</tr>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Participant demographics are shown in Table 4.3. The first participant was the founder or co-founder in all seven companies and currently held the position of CEO in six of the companies. The first participant selected the second based on the criterion of
being a key leader in innovation. Nine of the fourteen were original founders or co-founders. Leader participants were well educated: all had Bachelor degrees; six had masters degrees (five with Masters in Business Administration); and three had law degrees (Juris Doctor). Ages ranged widely. Time with the company spanned from seven years to twenty-three years (age of oldest company).

Table 4.3

<table>
<thead>
<tr>
<th>Founder/Co-founders (#)</th>
<th>9a</th>
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</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>7</td>
</tr>
<tr>
<td>Participant 2</td>
<td>2a</td>
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</table>

<table>
<thead>
<tr>
<th>Time with company (yrs.)</th>
<th>Average 14 (Range 7-23)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs.)</td>
<td>Average 47 (Range 37-66)</td>
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</table>

<table>
<thead>
<tr>
<th>Degrees (#)</th>
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</thead>
<tbody>
<tr>
<td>BA &amp; BS</td>
</tr>
<tr>
<td>MBA &amp; MS</td>
</tr>
<tr>
<td>JD</td>
</tr>
</tbody>
</table>

a Two additional after founding of companies: One Participant had been a founder of an acquired company, another Participant 2 had invested to become a co-owner and then COO, totaling four.

The response rate remained consistent and high throughout the process. All fourteen participants completed the ISPI™ prior to the interviews and were fully attentive during the interviews, answering the questions thoughtfully and completely. All but one participant made themselves available for the follow-up calls for clarification. All fourteen reviewed the summaries with responses ranging from complete agreement, “There is nothing more to say,” to changes and additional thoughts. This 100% response
rate was remarkable and was a powerful statement of their interest in the topic, acknowledgement of the quality of the effort, and their personal qualities of strong leadership.

The next section begins with the quantitative analysis, the secondary portion, of the concurrent embedded mixed method design of the research study. Qualitative analyses follow to answer Research Questions 1 and 2. The final analysis uses the mixed method approach to address Research Question 3.

**Quantitative Analysis**

This section reviews the quantitative portion of the concurrent embedded mixed method study. As the embedded or secondary portion, the objective of the quantitative analysis was to inform and enrich the qualitative and thereby, form an integrated and compelling mixed method. The quantitative effort utilized an instrument called the Innovation Strengths Preferences Indicator® (ISPI™). The results of the ISPI™ informed the interviews individually and collectively.

**ISPI™ background.** The ISPI™ was created as a tool to strengthen the human dimension of innovation. Since its creation in 2008, over 11,000 people have taken the ISPI™ and almost all agreed the results reflect their preferences and pre-dispositions (98% face validity).

The creators of the ISPI™ believed revealing the invisible orientations of individuals would provide groups insights for understanding the members, leveraging their differences, and working together more effectively. The principle of Leveraging Differences (Rosenfeld & Wilhelmi, 2011) rests on the belief that “only by understanding and leveraging individual differences, coupled with fostering a trusting environment and
appropriate soft values, can innovative potential ever be truly maximized” (p.54).

Innovation leaders must be effective in communicating across the range of innovation orientations. Identifying and valuing differences among people permits leaders to leverage them (Rosenfeld & Wilhelmi, 2011). Leaders must also be self-aware in terms of their own innovation preferences, particularly if they strive to “lead ambidextrously” in order to establish and maintain deliberate efforts both to exploit current capabilities for today and explore future opportunities for the future. The leadership task is balancing the tensions inherent to the duality, orchestrating the internally inconsistent alignments and their associated tradeoffs, and holding the efforts together with common strategies, overarching values and structural linking mechanisms. The ISPI™ reveals the type of projects (incremental, expansionary, or breakthrough) best fitting the preferences of individual leaders.

Feedback locates an individual on a continuum from builders to pioneers. People in the mid-range between pioneers and builders are called Bridgers. Simply described, Builders would naturally prefer projects that are evolutionary or incremental. Pioneers (P) would be most comfortable in revolutionary or breakthrough projects. People in the far ends of the orientations are called Extreme Pioneers (XP) or Extreme Builders (XB). Fewer people fall into XP or XB. Bridgers are in between and have a preference for either building or pioneering and so are called either Midrange Pioneers (P) or Midrange Builders (MB). Bridgers are very helpful to organizations with their ability to assist those on the extremes, such as: Pioneers in linking innovation to the existing organization for greater success in implementation, Builders in reaching for greater degrees of innovation, and Pioneers and Builders to work together more effectively. Bridgers are also a source
of ideas but are aware of the time dimension (e.g., “doable in my lifetime” versus Pioneers who often disregard the element of time). Bridgers stay mindful of implementation considerations, often looking to build or expand on current capabilities. Bridgers are well suited for expansionary problem-solving. (Appendices E and F).

The ISPI™ in the research study. Each of the fourteen participants took the online ISPI™ in the days preceding the one-on-one interview. Participants heard their ISPI™ summaries of their results as part of the last interview question and shared reactions including how the results seemed to fit. Then, they considered how their leadership approach varied for projects across the Innovation Continuum™.

The ISPI™ results informed the study on multiple levels. First was in preparation for the interview. Next was during the interview in noticing when responses were consistent or inconsistent with what the ISPI™ results would have indicated and probing for clarifications to understand more deeply or resolve a discrepancy. In asking the participant if there were questions or reactions about the ISPI™ results during the follow-up call, almost half shared reflections and a few asked for clarifications. Highlights of the ISPI™ results and the participants’ responses were included in the interview summaries. All respondents confirmed the summaries and some made additions and adjustments, but no one made changes to the section related to the ISPI™. As a result of these efforts, the ISPI™ data took on two forms: (1) feedback reports to participants and their reactions, and (2) a database of all fourteen participants (downloaded from the ISPI™ master database of Idea Connection Systems, Inc.). The quantitative portion of this dissertation study analyzed the database of all fourteen participants. The qualitative portion will
incorporate the responses from the participants. Then, the two analyses will be connected and compared as part of the mixed methods design.

**Quantitative analysis approach.** The ICS database provided the capability to generate reports. The first analysis looked at comparisons between the group of CEOs versus the group of second participants (who were selected by the CEOs). The results did not generate patterns or meaningful insights. One possible reason was that those holding the position and title of CEO did not have a set of pre-dispositions that clustered and were distinct from the pre-dispositions of those who were selected as the second participant. The expectation had been to find a leader duality, commonly described in practice and publications, in two role types in young and growing companies where one is the creative and the other the business leader. While there are many well-known examples of such a duality partnership, the experiences in this research study began to reveal more complex patterns and dynamics.

The analysis shifted to looking at the results of the ISPI™ in the way it was originally intended, as individuals in groups or teams. In this case, it was senior leaders in their innovation teams. The ICS Statistician and ISPI™ product manager, reviewed the results of the first analysis and concurred with the new direction. He connected this approach to the principle behind the ISPI™ and the intention of providing collective insights for teams to leverage differences (a key theory of this research study). He then provided guidance for running the reports and reviewing the data to support this approach.

For each of the seven companies, a sixteen-page report summarized and consolidated the ISPI™ results of the two participants. The reports graphed the
participants’ orientations, synthesized orientations into role descriptors, mapped some
descriptors to projects along the Innovation Continuum™, and consolidated participants’
results for the orientations of Control, Relationships, and Networking. The reports also
created a composite of the leaders on a single graphic called “Total ISPI™” which was
particularly useful for identifying overlaps and voids. In analyzing the reports, the plan
was to evaluate the orientations as they would merge in a collaborative effort and draw
insights into potential implications resulting from:

- Similarities of shared perspectives and comfort zones, providing easy and
efficient communication.
- Expanding coverage to take innovation through implementation and to
innovate across a wider range of the continuum.
- Complementary for greater balance.
- Blind spots.

- Missing orientations as guided by the principles and feedback of the ISPI™.

**Analysis of company leader pairs.** The researcher looked at the participant’s
individual ISPI™ orientations (arranged on a “totem” as portrayed in Appendix K) and
the specific results as depicted by locating an icon along a continuum for each
orientation. The Innovation Orientations (iO™) describe how the leaders prefer to
innovate and solve problems (Ideation, Risk, Process and a weighted average for Total
iO™). Each of the orientations is divided into standard deviations (a standard deviation
was shown divided into thirds). The numbering begins with the center line as the origin,
so the first placement to the right of the center line would be MP1 and the second MP2.
Similarly, the first placement to the left of the center line would be MB1 and the second
MB2. These placements become clear when reviewing the actual graphic representations (all seven follow in the individual analyses).

The Innovation Orientation Modifiers (iOM™) were also instructive in understanding how the leaders work together with a focus on innovating and leading the company through growth. With a view into personality preferences, the iOMs™ provided insight into how the person would think and decide (cognitive), interact with others (affective), and take action (conative or instinct). The preferences became meaningful when considering how the leaders came together as leader pairs and how they worked with their organization and external constituencies to innovate and grow.

By analyzing the two leader participants in the composites, the iO™ and iOM™ orientations began to portray potential leadership dynamics. The approach to analysis was consistent for each leader pair. The analysis began with a look at the individual leader’s ISPI™ components (i.e., each orientation within the iO™ and iOM™). Any descriptors as assigned by the ISPI™ algorithm (based on certain groups of orientations) were noted. Then, analysis of the two profiles of the leader pair considered the two leaders working collaboratively. For the iO™ orientations, means and standard deviations captured the degree of similarity or difference between the two leaders.

Based on descriptions of each orientation preference, analyses and potential implications were found for each of the seven leader pairs (Appendix K). Pinggers were identified at the top. Statistical analyses were generated (i.e., means and standard deviations) for innovation orientations (iO™). Specific descriptions for those with certain combinations of preferences (e.g., “Conceptualizers” who those who had “Visionary” and
“Diverge” preferences) were included in the bottom row of analysis. An overall summary for each leader pair was located in the bottom right cell.

The feedback from the individual feedback and the team reports from the ISPI™ database provided much information and many useful graphics. Selected key inputs to the analyses and overall summaries follow in the paragraphs below for each of the seven leader pairs.

**Company Rochester-A.** The Innovation Orientations (iO™) for each participant in Rochester-A (ROC-A) are shown below. The Totem Composite of the company pair of leaders (“leader pairs”) also follows (see Figure 4.1).

From the ISPI™ results, this leadership pair appeared strong with several areas that were similar or complementary, supporting ease of understanding and collaboration. Both were Pinggers (P or XP in Ideation and Risk) who create ideas prolifically, link insights across multiple planes, think outside the box, and challenge the system. Both leaders were “Conceptualizers” (“Visionary” and “Diverge” preferences). A complementary orientation was in Output (decision-making approach). Combined with their “Visionary” orientations, one’s Output of “Head” represented an “Architect” and the other’s Output of “Heart” represented a “Cause Driver.” Together, the two had the potential of imagining solutions that were both most effective and also considerate of how people would utilize or embrace them. Missing orientations were a Process Builder to implement and optimize, convergent thinker, and someone who can sense data and prefers concrete information to build toward the big picture. This potential blind spot could be alleviated with a “Protector” (“Concrete/Converge”) who would guide new ideas in their early stages.
Totem Composite (50% indicates one participant and 100% indicates both participants)

**Figure 4.1. Analysis of ISPI™ Results for Participants in Rochester.**
**Company Rochester-B.** The Innovation Orientations (iO™) for each participant in Rochester-B (ROC-B) are shown below. The Totem Composite of the company pair of leaders also follows (see Figure 4.2).

This leader pair was also strong in mutually re-enforcing and complementary orientations. Both were Pinggers providing prolific ideas and willingness to pursue unconventional approaches. Process was an orientation with significant difference (4 bars and crossing the center line). The CEO’s orientation as an Extreme Builder (XB), combined with being a Pingger put him in a small group known as “Creative Optimizers.” The CEO/COO partnership was one where ideas abound but there was a strong desire to implement and build systems to optimize. Networking was another complementary area where the pair’s orientations could be combined into a “Yes/Yes” for Networkding-I Initiate/Others Initiate. Together, the pair had the potential of seeming approachable and enthusiastic about forming connections, something essential to a company in its early stages. Their mutual orientation to “Action” and accepting mistakes as part of the learning process would support experimentation. There could be a tendency for leaders who are Pinggers with a strong “Action” preference to move too quickly for external constituents. The CEO’s XB Process orientation would likely mitigate this tendency and provide the structure or system for necessary caution.
Totem Composite (50% indicates one participant and 100% indicates both participants)

**Figure 4.2.** Analysis of ISPI™ Results for Participants in Rochester-B.
**Company Rochester-C.** The Innovation Orientations (iO™) for each participant in Rochester-C (ROC-C) are shown below. The Totem Composite of the company pair of leaders also follows (Figure 4.3).

This company pair of leaders also consists of two Pinggers. Similar to the pair in ROC-B, Process was the greatest area of difference in the iO™ orientations but in ROC-C, both were on the Pioneer side and half the difference (2.5 bars instead of 5, with 3 bars equating to one standard deviation). The difference in Process provided a highly useful role with this pair in providing a bridge for the CEO’s XP in process for translation of ideas into systems for full implementation. A missing orientation was someone who would build and optimize the process.

Analyzing the Innovation Orientation Modifiers (iOM™) revealed gaps and mutual supports. A gap was a missing orientation in Flow, where a convergent thinker would be helpful in balancing the pair’s preference to “Diverge,” shifting the dynamic from generating possibilities to actualizing one from a discrete set of options. The CEO would be comfortable in meeting the VP’s preference for “Action” and leading with the “Head” in decision making. He was equally comfortable, however, being “Prudent,” depending on the situation, and being flexible to use “Heart” in certain cases. His ability to shift extended the pair’s preference to a wider range of problems and opportunities. The VP’s Bridger orientation in Process also contributed to linking the CEO’s preference for novelty and unexpected angels to conditions necessary for implementation.
Totem Composite (50% indicates one participant and 100% indicates both participants)

Figure 4.3. Analysis of ISPI™ Results for Participants in Rochester-C.
**Company Charlotte A.** The Innovation Orientations (iO™) for each participant in Charlotte A (CLT-A) are shown below. The Totem Composite of the company pair of leaders also follows (see Figure 4.4).

This leader pair had many areas that complement and extend. The iO orientations were almost mirror images across the center line. Both were Bridgers in Ideation, Risk, and Process, but in opposite directions (differences ranging 1.5-2.5 bars, with three bars equating to one standard deviation). Overall, they made a good team for translating pioneering ideas into the details of design and implementation and creating new expansionary ideas. In process, they had the potential to cover projects across the full Innovation Continuum™. In turbulent times, they may lack someone to generate breakthrough ideas or create a new paradigm (a Pingger). The other co-founder (not interviewed) may bring a Pioneer orientation to the iO mix. In the iO orientations, the pair overlaps and extends each other, providing wider coverage. The VP bought the profile of an “Architect” (“Visionary” and “Head” preferences), meaning open to new intriguing problems and works well with ideas. A potential blind spot could be in Networking - Initiate (“Flex” for one and “No” for the other), in growing the business and reaching out to many constituencies. In the area of Energy, one was “People,” seeking interactions, and the other was “Self,” preferring to process and re-charge alone. This difference could be a source of conflict without mutual understanding and ways to optimize the preferences of each.
Totem Composite (50% indicates one participant and 100% indicates both participants)

**ISPI™ Results By - Team Charlotte A**

Taken between 08/07/2013 and 08/07/2013
Total ISPI™s. n=2

**iO®**

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<th>XP</th>
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**iOM®**

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**Concrete**

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**Converge**

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**Passion**

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**Output**

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</table>

**Energy**

| 50% | 0%  | 50% |

*Figure 4.4. Analysis of ISPI™ Results for Participants in Charlotte-A.*
**Company Charlotte B.** The Innovation Orientations (iO™) for each participant in Charlotte B (CLT-B) are shown below. The Totem Composite of the company pair of leaders also follows (see Figure 4.5).

The CEO’s total Innovation Orientation was a Midrange Pioneer (MP). Ideation and Process were Midrange Builder (MB) and pulled to the right of the center line with a Pioneer orientation in Risk (unconventional perspectives. The COO was a Pingger (Pioneer in Ideation and Risk) and a Bridger in Process. The biggest difference in the pair was in Ideation (difference of 2.5 bars, with three bars equating to one standard deviation). The CEO and COO formed a combination with the potential of covering projects across the full Innovation Continuum™.

The Innovation Orientation Modifiers (iOM™) showed similar, extending, and complementary orientations. There was a potential blind spot in Networking - Others Initiate, with one as “No” and one as “Flex.” A missed opportunity or undetected problem may not be given priority if the leaders were deep into task mode or driving towards a goal. Overall, in looking at the pair from across orientations, the pair seemed to do a sort of cognitive dance.
Participant 1

Participant 2:

Totem Composite (50% indicates one participant and 100% indicates both participants)

Figure 4.5. Analysis of ISPI™ Results for Participants in Charlotte-B.
*Company Charlotte C.* The Innovation Orientations (iO™) for each participant in Charlotte C (CLT-C) are shown below. The Totem Composite of the company pair of leaders also follows (see Figure 4.6).

The leader pair was a strong team in similarities making for shared comfort zones and efficiency. Both had Total Innovation Orientations (iO™) of Midrange Pioneers so they were most comfortable working expansionary projects and bridging pioneering ideas for others to build new systems and capabilities. In Ideation specifically, the leaders are close (difference of 0.5 bar, with 3 bars equating to one standard deviation) but the pair straddles the center line. A missing orientation was Pioneer in Idea and Risk (a Pingger), someone to be a source of breakthrough ideas, paradigm challenger, and divergent thinker. These abilities may be critical in the technology-oriented market space that this company occupies. Also missing was a Builder in Process for implementation and optimization. In Networking, the VP’s comfort with Others Initiating could complement the CEO’s low comfort.
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Totem Composite (50% indicates one participant and 100% indicates both participants)

### ISPI™ Results By - Team Charlotte C

Taken between 08/05/2013 and 08/08/2013
Total ISPI™s: n=2

#### iO®

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#### iOM®

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<tr>
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<table>
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*Figure 4.6. Analysis of ISPI™ Results for Participants in Charlotte-C.*
Company Charlotte D. The Innovation Orientations (iO™) for each participant in Charlotte D (CLT-D) are shown below. The Totem Composite of the company pair of leaders also follows (see Figure 4.7).

In Ideation, both leaders were Midrange Pioneers (MP) and therefore comfortable playing the role of Bridger between Pioneering ideas and implementation as well as creating ideas for expansion. The VP had a higher Risk orientation than the CEO, potentially extending a shared comfort zone with novel approaches and being a catalyst for change. A significant difference was in the Process orientation (5 bars, with 3 bars equating to one standard deviation). The CEO, as Process Pioneer (P), would use internal systems, prefer unstructured situations, and delegate routine tasks. The VP, as a Process Builder (B), would optimize to maintain stability and painstakingly master the detailed work of incorporating new data into existing systems. A missing orientation was Pioneer in Ideation as well as Risk (Pinger) but might have been present in CTO (not interviewed).

In the Innovation Orientation Modifiers (iOM™), the two had similar, expanding, and complementary orientations. A missing orientation was someone willing to remain in divergent thinking while additional options were generated, possibility breakthrough ideas, so as to avoid limiting options pre-maturely. A “Prudent” orientation would be missing since both have orientations of “Action,” but that could be mitigated by the VP’s Builder preference in Process. The difference in Energy, CEO being “Self” and VP being “People,” could be a source of conflict if misunderstanding of the difference were not seen and accommodated.
**Totem Composite** (50% indicates one participant and 100% indicates both participants)

**ISPI™ Results By - Team Charlotte D**

Taken between 08/08/2013 and 08/11/2013
Total ISPI™s: n=2

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<th></th>
<th>XB</th>
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</tr>
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<td>Flex</td>
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*Figure 4.7. Analysis of ISPI™ Results for Participants in Charlotte-D.*
Entrepreneur Role as indicated by ISPI™ results. The ISPI™ feedback reports generated roles given individuals’ orientation preferences. One role for innovation teams was “Entrepreneur-startup.” For companies in startup and growth, a founder-leader as entrepreneur can be critical. The analysis investigated the number who fit that role as defined by the ISPI™.

The ISPI™ feedback reports listed the value-added and potential downside for those with orientations falling into the role description of entrepreneur:

**Entrepreneur (Startup)**: Value Added: Actively takes on personal risk to start a new company based on high personal confidence plus passion for their idea. Potential Downside: They may be overconfident and/or lack the experience of doing a successful startup.

The analysis included reviews of the fourteen feedback reports for the instances of the role of “Entrepreneur-Startup.” Six of the fourteen leaders (43%) received the Entrepreneur Role for projects that were Evolutionary (Incremental) and Expansionary. The number dropped to five (36%) for Revolutionary (Breakthrough) projects. These percentages of role assignments presented discontinuity given that nine of the fourteen leaders (64%) had been initial founders (i.e., sole founders or co-founders) and two had become partial owners later (i.e., through investment or merger) for a total of eleven (79%). The analysis went deeper and accessed reports and data made available by the ISPI™ owners, Innovation Connection Systems ICS).

The incidence of the Entrepreneur role was significantly higher for the leaders in the research study when compared with the database of all people who had taken the ISPI™ (see Table 4.4). The incidence was twice as high or greater, as would be expected.
Noteworthy was the skew in the iO™ orientations in the ICS database (over 11,000)
toward Midrange Pioneers and Pioneers, given the many innovation leaders, practitioners
and R&D professionals from large companies who had taken the ISPI™.

Table 4.4

Entrepreneur Role based on ISPI™ Orientations

<table>
<thead>
<tr>
<th>ISPI™ Database (n=11,000)</th>
<th>Incremental/ Evolutionary</th>
<th>Expansionary</th>
<th>Breakthrough/ Revolutionary</th>
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<tr>
<td>Research Participants</td>
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</tr>
<tr>
<td></td>
<td>21.6%</td>
<td>21.4%</td>
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<tr>
<td>ROC-B</td>
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<tr>
<td>Participant 1</td>
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<td>Indicated</td>
</tr>
<tr>
<td>Participant 2</td>
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<td>Indicated</td>
</tr>
<tr>
<td>ROC-C</td>
<td></td>
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</tr>
<tr>
<td>Participant 1</td>
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<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Indicated</td>
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<td>Indicated</td>
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<tr>
<td>CLT-A</td>
<td></td>
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</tr>
<tr>
<td>Participant 1</td>
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<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Participant 2</td>
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<td>Not indicated</td>
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<tr>
<td>CLT-B</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>Not indicated</td>
<td>Not indicated</td>
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<tr>
<td>Participant 2</td>
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</tr>
<tr>
<td>CLT-C</td>
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<tr>
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<table>
<thead>
<tr>
<th>ISPI™ Orientations Fitting Entrepreneurial Role (# Indicated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals (# Indicated)</td>
</tr>
<tr>
<td>Percent of 14 Individuals</td>
</tr>
<tr>
<td>Leader Pairs (# Indicated)</td>
</tr>
<tr>
<td>Percent of 7 Companies</td>
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</table>
To understand what was missing from the participant leaders’ orientations, a review of a report showed the criteria (but not the actual algorithm). By looking at the essential orientations compared with the profiles of leaders who were not assigned the Entrepreneur role, the missing pieces were revealed. The largest criterion preventing the assignment was that Pioneer (or XP) in Ideation and Risk was required for all project types. The essential orientation of “Yes” for Networking was the most commonly missing in the iOM™.

Next the analysis considered the combined orientations of the leader pairs against the criteria. Naturally, the incidence percentages increased since presence of one gives the pair a “Yes.” What was interesting was as a pair, the missing essential iOM™s had better coverage. The algorithm considered other orientations to be helpful allowing orientations in the middle (i.e., “Flex” or “Depends”) to fill the requirement through pair formation. For example, in the criteria noted as “problematic,” instances of “No” in Networking were neutralized by the presence of the other leader who had “Yes” or “Flex” (in six of the seven companies). This possibility of collaborating and compensating afforded opportunities for playing the role of Entrepreneur as a team rather than only as a single individual and provided partial, but important, explanation of the companies’ growth and continued success.

**Summary.** The quantitative analysis started with an attempt to compare two groups, the CEOs (Participant 1) versus the second innovation leaders (Participant 2) but led to no meaningful observations. Then the analysis shifted to following the fundamental purpose of the ISPI™ instrument and looked at senior leaders in their innovation teams (i.e., leader pairs in this research study). More meaningful, albeit complex, patterns and
dynamics emerged. This approach offered more potential in explaining ambidextrous leadership as the leaders worked with projects spanning the Innovation Continuum™. 

For the individual leaders, the ISPI™ results indicated where they personally would be most comfortable in innovating, particularly across types of projects. Moving to analyzing the leader pairs, each pair had the potential of greater strength as a pair than individually but there was significant variation. Some pairs were strong by reinforcing and extending one another providing ease of mutual understanding and efficiencies in decision making. Other pairs showed strong complementary orientations to provide balance and thereby cover a larger range of the Innovation Continuum™ or to provide a stronger implementation capability for innovative ideas.

Yet, each leader pair had missing orientations, blind spots, and potential conflicts as related to innovating projects both evolutionary and revolutionary and to moving a company through growth. Some had Pioneering strength in Ideation and Risk but had need for Builders for linking ideas to current capabilities. Others had strength in Bridging Pioneering ideas to implementation or would be a good source of expansionary ideas themselves but may be lacking the capability of creating a radical idea or new paradigm should the industry become tumultuous or a full pivot be warranted. Following the same lines, two companies needed someone to add convergent thinking and two others needed someone to add divergent thinking. Two companies needed Networking capability. Three companies needed someone clearly “Prudent.”

Missing orientations could turn into blind spots. Lack of a Builder could lead to inadequately considering issues and timing related to implementation when ideas are being generated. Having both leaders with Passion of “Action” could cause advancing
before others internal and external to the company deemed the solution “ready.” In Networking, a void of someone who appreciated and was at ease in that role could neglect establishing and nurturing the many connections necessary for high growth. Potential conflicts centered around one leader as “Self” and the other as “People” (four leader pairs). Not appreciating the implications of this particular difference (i.e., how people process their thinking and how they re-charge their energies) could lead to misunderstandings, persistent miscues, or chronic situation of operating against type and thereby sub-optimally.

The analysis of fit with the “Entrepreneur” role evaluated the leader profiles against a certain orientation combination seen to be critical for companies in their early stages. The algorithm used certain weightings that made the gaps even more pronounced than in the leader pair analysis alone. The incidence of leaders receiving the “Entrepreneur” role was approximately twice the ISPI™ database. The incidence was even greater (four or 57%) when viewing the companies as leader pairs. For the other three leader pairs, the essential orientations missing were the presence of a Pinggers (i.e., Pioneer in Ideation and Risk) and a preference for Networking - I Initiate/Others Initiate. Other orientations had middle areas (i.e., “Flex” or “Depends”) that counted as helpful and so were filled through pair formation.

The notion of approaching ambidextrous leadership with leader pairs was promising. Together, the pair provided a fuller range of orientations conducive for the different types of projects than the CEOs offered themselves. The picture was not complete, however, for the broad challenges of innovation implementation. To sustain innovation, leader pairs needed others as well to complement their orientations,
supplement their efforts, and illuminate the blind spots. Overall, the possibility to work together as senior leaders to create coverage by compensating and collaborating was compelling as an explanation for the success of the full set of companies in this study. Leveraging difference was seen as beginning within the senior leader team.

The next section reviews the qualitative analyses to answer research questions one and two using content analysis. Research question three will be addressed in the section that considers mixing the methods.

**Qualitative Analysis**

Content analysis was the research method used to transform data collection into results. Management researchers have used content analysis effectively to “leverage the conceptual and analytical flexibility afforded by the method to yield studies mixing inductive and deductive approaches based on rigorous quantitative analysis as well as rich qualitative insight” (Duriau, Reger, & Pfarrer, 2007, p.23). In this research study, content analysis was the data analysis method for the qualitative portion. There were three research questions:

1. Based on interviews, is there evidence of ambidextrous leadership in small and medium enterprises (SMEs)?
2. In seeking to advance an organization on its innovation trajectory, how do senior leaders of SMEs ensure the capabilities both for exploiting current innovation and continuously exploring future innovations?
3. How do the innovation orientations of SME leaders motivate innovation and its implementation as measured by the Innovation Strengths Preference Indicator® (ISPI™)?
These questions required a mix of deductive and inductive content analyses; selection was guided by the findings of Elo and Helvi (2007):

Inductive content analysis is used in cases where there are no previous studies dealing with the phenomenon or when it is fragmented. A deductive approach is useful if the general aim was to test a previous theory in a different situation or to compare categories at different time periods. (p. 107)

Deductive content analysis (also referred to as “directed content analysis”) was utilized in Question 1 since the objective was to identify evidence of the presence of ambidexterity as defined in the literature. The question was a relatively closed one, asking “is there?” Inductive content analysis (also referred to as “conventional content analysis”) guided analyzing Questions 2 and 3 since knowledge has been fragmented in the area of ambidextrous leadership in general and in SMEs in particular. The questions were open ones, asking “how?”

The coding process was guided by Creswell (2009) and started by dividing the interview text into chunks and labeling with paraphrases, phrases, and paragraphs “in the actual language of the participant (called an in vivo term)” (p. 186). After review of the transcripts and recordings, interview summaries (two to four pages each) were sent to each participant to get feedback on the observations, as a member check (100% response rate). The summaries served as the basis for creating codes. Codes were the units of data selected for that question and copied onto Post-It® Notes (each company a different color). These Post-It® Notes were affixed onto a tri-fold poster board, grouped by participants and companies for the next steps of analysis. The work began independently
in selecting and forming the codes onto the Post-It® Notes. To enhance reliability, an associate assisted with expertise in conceptual analysis, as well as executive leadership, was enlisted. He assisted in evaluating codes against criteria, grouping codes into themes. Methods to ensure inter-rater reliability were devised during both directed and conventional content analyses.

**Research Question 1: Based on interviews, is there evidence of ambidextrous leadership in small and medium enterprises (SMEs)?** Directed content analysis was employed in reviewing the responses to the six questions in the interview guide. The analysis began with reviewing the interview summaries and highlighting text pertaining to ambidexterity as defined in the literature. The highlighted text were converted into Post-It® Notes and affixed to the tri-fold board. The next step was to compare the codes against a consistent description applied to all leader participants.

Forming a collection of almost 200 Post-It® Notes, the excerpts were a mix of comments relating to efforts of the individual, the senior leadership team, and the organization as a whole. To view the evidence most clearly, it was necessary to recognize that evidence manifests ambidexterity in forms of individual senior leader, the leadership team, and the organization itself. Aspects of ambidexterity (described below) spanned these three forms. Codes for the two leader participants in each company were combined to gain better insight into the dynamics of the three forms of ambidexterity evidence.

Aspects of ambidexterity were derived from the research literature. The intent was to capture distinct themes by identifying areas of consistencies. While informed by broad reading on the topic, focus was on the work of the thought leaders in ambidexterity: O’Reilly and Tushman (1996, 1997, 2004, 2008) and Govindarajan and Trimble (2005,
2010, 2011). After summarizing, reducing, and sorting, the key areas were translated into statements. Six aspects of ambidexterity emerged and served as the categories in the directed content analysis:

1. **Senior leadership establishes and maintains deliberate efforts to exploit current capabilities for today and to explore opportunities for the future.** Evidence of managing the duality would include a balance of projects along the Innovation Continuum™, a balance of time among efforts in existing (continuous improvement), new products and/or markets (product/market development efforts), and new/new (diversification), and processes and policies to support the duality.

2. **Alignment and a culture that tolerates the paradox.** Evidence would include a common strategic intent, an overarching set of values, a common vision, and descriptions of managing a dual environment.

3. **Tension held at the top.** Evidence would include the senior team making strategic tradeoffs and reconfiguring assets to support the duality.

4. **Agility to create dynamic capability.** Evidence would include senior-level efforts with the intention of creating agility throughout total organization, shifts to accommodate the duality and manage the duality, and pivots in response to opportunities and threats.

5. **Custom organization models to support the duality.** Evidence would include organizational approaches, such as separate efforts with mechanisms to leverage shared assets.
6. *Exploration experimentation for rigorous learning.* Evidence would include efforts to reduce uncertainty by narrowing assumptions.

All leader participants participated in the one-on-one interviews held in their offices or conference rooms. The semi-structured interviews consisted of six questions which were predominantly open-ended. Two questions involved guided exercises. In the first guided exercise, the leader was asked to think of the major projects related to product and services (ten or fewer), note a descriptive label, and then sort them into piles of short-term (a year or less) and long-term (over a year). The next sort was into project types: evolutionary/incremental, expansionary, and revolutionary/radical/breakthrough. The first sort served as a warm-up to the second sort with the objective of revealing the degree of balance of projects along the Innovation Continuum™. The second exercise sought to reveal that leader’s personal allocation of time among projects of different types using Ansoff’s Product-Market Matrix, originally published as Ansoff’s Growth Vector Matrix (1965) (see Figure 4.8).

![Figure 4.8: Ansoff’s Growth-Vector Matrix (1965, Permission granted, Appendix J). Also commonly known as Product-Market Matrix. Quadrants labeled for reference in study analyses.](image)

Results of the two interview exercises were used as input to evaluate the aspect of ambidexterity relating to balance and deliberate efforts.
For each aspect of ambidexterity, degrees of evidence were determined using the combined evidence of each leader pair. Evaluation was determined to be strong, medium, or weak and depicted in tables using symbols for degree of evidence: ★ for strong evidence; ★★ for medium evidence, and ★★★ for weak evidence.

**Ambidexterity in Company Rochester-A.** Interviews with the two leaders from Rochester-A (ROC-A) were reviewed and summarized for verification by the leaders. Data were selected and placed into codes that were mapped onto the six aspects of ambidexterity. A compilation of the evidence levels is shown in Table 4.5 and followed by analysis of the input for each aspect of ambidexterity.

Table 4.5

<table>
<thead>
<tr>
<th></th>
<th>Duality/Balance</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/Separate Efforts</th>
<th>Experiments/Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROC-A</td>
<td>★★</td>
<td>★</td>
<td>★★★</td>
<td>★★★</td>
<td>★★★</td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols: ★ Strong, ★★ Medium, ★★★ Weak.

Two-exercises conducted in the one-on-one interviews provided input for evaluation of the “Duality/Balance” aspect. The results of the card sorting exercise showed projects spanned the Innovation Continuum™ and indicated a strong balance (see Table 4.6). When allocating project time among quadrants of Ansoff’s Project-Market matrix, the leaders revealed a bias toward future horizons, particularly in the case of the VP of Strategy’s dedication of time to “new product/new market” projects, giving “most of my time” rather than a specific percentage (see Table 4.7).
Table 4.6

**Rochester-A Interview Exercise: Assignment of Top Projects to Innovation Types**

<table>
<thead>
<tr>
<th>ROC-A Leader/Number of Projects</th>
<th>Evolutionary/Incremental Projects</th>
<th>Expansionary Projects</th>
<th>Revolutionary/Radial/Breakthrough Projects</th>
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<tr>
<td>Participant 1</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Participant 2</td>
<td>3</td>
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<td>3</td>
</tr>
<tr>
<td>Average</td>
<td>3</td>
<td>2.5</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Table 4.7

**Rochester-A Interview Exercise: Allocation of Project Time in Product-Market Matrix**

<table>
<thead>
<tr>
<th>ROC-A: % Project Time/Quadrant (Q)</th>
<th>Existing/Existing (Quadrant a)</th>
<th>New Products and/or Markets (Quadrants b+c+d)</th>
<th>New/New (Quadrant d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>40%</td>
<td>60%</td>
<td>15%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>15%</td>
<td>85%</td>
<td>“Most of my time”</td>
</tr>
</tbody>
</table>

Both leaders related the executive team was composed of almost an even mix of builders and pioneers providing evidence that balance was achieved through the combined efforts of the full leadership team. The VP also indicated he relied on design managers for complementary skills of project and risk management. Other considerations indicated efforts to achieve duality and balance with limited resources, including:

- Organizational capabilities to both exploit today’s products and markets and explore the future. Master Process supports consistent delivery of today’s services and provides a system for incorporating expansions. Duality of external sensing of customer input and technology and internal efforts for improvements and “ontological efforts.”
• Success with “the new and shiny stuff” and efforts to strengthen implementation and support. Constant innovation to deliver better service.

• Major efforts to ensure strong internal capabilities (e.g., process and leadership tools) and also “breaking open new mindsets so new possibilities are recognized.”

• “There’s no balance.” “The curve always trying to stay ahead of is, keep customer happy, keep the innovation flowing.”

Evidence of alignment was strong. The company values included “innovation” (through experimentation) and “elegance” (by keeping things simple) and had endured the years and a recent update. The CEO devoted serious effort to framing communications by considering the way employees “see the world” in order to overcome resistance, encourage adoption, and build ownership so it becomes “their innovation.” He was confident the leadership team and the company were “completely aligned on priorities.”

Tension was held at the top. The leadership team resolved resource contentions and made tradeoffs. Although priority was not balanced between today’s and future projects, the criteria were clear: deliver on today’s promises and then allocate to revolutionary projects.

Agility to enable shifts and pivots (dynamic capabilities) was seen in the predisposition of embracing and adapting to the constantly changing market, as evidenced when jumping into the mobile product-market space. The company is currently undergoing a revolutionary reconfiguration to enter the Cloud product-market space. The effect was described as “completely throwing out our support organization and figuring
out how to do it differently than anyone else in the world.” This idea was seen as “a double shift in our strategy.” Moving up the value chain into the Cloud was depicted as a “full pivot.”

Executive team members led subgroups tasked with investigating and exploring new ideas. There was no further evidence of a model to support duality. Strategic plan reviews had been moved from annually to quarterly to keep closer to current and accurate information. Trade-offs seemed to be made on a real-time basis.

Experimentation for rigorous learning was strong in evidence. The Master Process provided a consistent means of integrating new acquisitions and new methods (if proven through experimentation). Learning through better experimentation was evident: employee training, “the language of possibility” for problem definitions, and employees free to champion their ideas. One leader described the company’s approach to be “iterate and learn” and related results of many successes and “spectacular failures.” He went on to emphasize, “But we learn from them….Keep iterating and keep trying.”

*Ambidexterity in Company Rochester-B.* A compilation of the evidence levels for Rochester-B (ROC-B) is shown in Table 4.8 and followed by analysis of the input for each aspect of ambidexterity.

Table 4.8

<table>
<thead>
<tr>
<th></th>
<th>Duality/Balance</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/Separate Efforts</th>
<th>Experiments/Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROC-B</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>♦</td>
<td>★</td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols: ★ Strong, ♦ Medium, ○ Weak.
Projects spanned the Innovation Continuum™ as sorted by both leaders and indicated moderate balance (see Table 4.9). When allocating their project time using Ansoff’s Project-Market matrix, leaders showed energies in all quadrants with less in “new products/new markets,” projects for future needs or diversification (see Table 4.10).

Table 4.9

<table>
<thead>
<tr>
<th>ROC-B Leader/Number of Projects</th>
<th>Evolutionary/Incremental Projects</th>
<th>Expansionary Projects</th>
<th>Revolutionary/Radial/Breakthrough Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Participant 2</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4.10

<table>
<thead>
<tr>
<th>ROC-B % Project Time/Quadrant:</th>
<th>ROC-B</th>
<th>Existing/Existing (Quadrant a)</th>
<th>New Products and/or Markets (Quadrants b+c+d)</th>
<th>New/New (Quadrant d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>40%</td>
<td>60%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Participant 2</td>
<td>50%</td>
<td>50%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

The senior leadership team consisted of the three founders and the science-centric researchers. The three founders, having high mutual trust, “are generally able to bring forth something that’s truly innovative, is conceptually practical, and can actually be delivered…the pillar that each person brings.” The innovations from “the deep scientific bench” created differentiation in the marketplace. The company had entered into a joint venture in a distinct but related area. The leaders spoke of specific efforts to balance efforts for today and for the future. One spoke of the “yin and yang” between the three-year technology roadmap and the next release and noted progress, “We now have more
definite long-term priorities that we know need to be delivered up.” One leader was keenly aware of the need to explore the horizon and anticipate the unexpected scientific breakthroughs. Yet, maintaining the balance was a struggle as one leader summarized (referring to future innovation as “back-up”):

For a company that wants to be service-oriented and lean and profitable, actually deliver[ing] things to paying customers…always wins over the back-up things and that’s a big problem, because a lot of the innovation is really a back-up project…last priority on most days.

Evidence of alignment was primarily in the area of cohesiveness as a team, coming together to deliver to the customer and maintain “the whole happy ecosystem.” In managing paradox, the first lens is the customer relationship and revenue and the next is cost and productivity. The value placed on innovation provided additional evidence.

To encourage idea generation, one leader facilitates that process by helping the team “percolate them” and by bringing them to light for evaluation. He encouraged everyone to notice opportunities and suggest improvements.

Evidence of tension being held at the top was in the depictions of resource contentions resolved through the leader with the appropriate responsibility and “all loop through [the CEO] for some aspect.” The combination of the triad of the co-founders was rich in talent. One leader indicated that managing the tensions worked by them being closed knitted together.

Evidence of agility was strongest in the mindset of making decisions at ‘the last responsible minute.” There was little evidence of a custom organization model or occurrences of separate efforts. “Tiger teams” were formed for mini-experiments,
typically using “magic time.” The right balance of work was found to be a mix of immediate project work and time allowed for experimental work. The same resources worked on deliverables using existing technologies as on studies to test scientific hypotheses. Therefore, no mechanisms for sharing were warranted.

Detailed evidence was shared regarding the lean methodology used to qualify a project before entering formal R&D. In fact, one leader noted, “The single biggest organizational capability … is the rapid prototyping, rapid iteration where we work both the technology as well as the customer in parallel.” The mindset was that information gathered from experiments was more important than actual outcomes. If an experiment failed, they would simply move on to the next scenario to test, having gathered possible scenarios from all corners of the organization.

**Ambidexterity in Company Rochester-C.** A compilation of the evidence levels for Rochester-C (ROC-C) is shown in Table 4.11 and followed by analysis of the input for each aspect of ambidexterity.

Table 4.11

*Rochester-C Evaluation Considering Aspects of Ambidexterity*

<table>
<thead>
<tr>
<th>Duality/Balance</th>
<th>Alignment</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/Separate Efforts</th>
<th>Experiments/Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROC-C</td>
<td><img src="strong.png" alt="Strong" /></td>
<td><img src="strong.png" alt="Strong" /></td>
<td><img src="strong.png" alt="Strong" /></td>
<td><img src="medium.png" alt="Medium" /></td>
<td><img src="strong.png" alt="Strong" /></td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols: ![Strong](strong.png) Strong, ![Medium](medium.png) Medium, ![Weak](weak.png) Weak.

Key projects were skewed to the future (i.e., expansion and breakthrough) since the current strategy was to create products, shifting from current capabilities of a systems
house (see Table 4.12). Similarly, when allocating project time using Ansoff’s Project-Market matrix, the leaders revealed a clear bias toward future horizons (see Table 4.13).

Table 4.12

*Rochester C Interview Exercise: Assignment of Top Projects to Innovation Types*

<table>
<thead>
<tr>
<th>ROC-C Leader/Number of Projects</th>
<th>Evolutionary/Incremental Projects</th>
<th>Expansionary Projects</th>
<th>Revolutionary/Radial/Breakthrough Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>0</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Participant 2</td>
<td>0</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>0</td>
<td>3.5</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 4.13

*Rochester C Interview Exercise: Allocation of Project Time in Product-Market Matrix*

<table>
<thead>
<tr>
<th>ROC-C: % Project Time/Quadrant</th>
<th>Existing/Existing (Quadrant a)</th>
<th>New Products and/or Markets (Quadrants b+c+d)</th>
<th>New/New (Quadrants d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>0%</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>20%</td>
<td>80%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Both leaders were charging ahead with the strategy of moving to a product business. The CEO was the company visionary and systems builder. One leader had taken the reins of the newly formed R&D group, completed the LaunchPad experience, and was bringing the methods to the company. He had increased his overall time on key projects from 30% to 80%. Others on the leadership team were maintaining the operational aspects of current projects. The COO was said to have strong orientation as a Builder and skills to implement and execute and the Director of project Engineering had done a masterful job in consolidating the thinking and gaining agreement among three groups responsible for software, project engineering, and quality assurance. This
improvement addressed the prior problem described, “The senior people within the melting pot would never get the focus on [future] initiatives; they were always being pulled into the production discussions.” To provide additional leadership to support the duality, a new executive, with skills complementary to the CEO’s, would be joining to foster the growth.

In terms of alignment, the CEO had been a systems creator by linking related aspects to form complex systems, professionalizing with processes and measurements to cross the “chasm from a small company to a larger company.” Everyone had the same goal to deliver current jobs and develop products for next year. The vision and strategy to move to a product company was clear.

Tension was held at the top. Leadership built the organizational capability to get ideas and complaints known and resolved quickly, prevent fiefdoms, and ensure true information flows (with cross-functional issues raised to senior leadership). The CEO was “big on change and fights stagnation.” He was encouraging more challenge and debate with the executive team.

Agility was present and increasing as the company was shifting to a new business model and the leadership reconfigured resources to embrace emerging growth opportunities. Its plan was to “ignite the market as a service.” Efforts were to make the work scalable and predictable as the company moved to products delivered through service subscriptions. The VP of R&D was “trying to get back to aspects of the early days” being more agile and responsive and spending more time talking with customers. The culture was expanding to embrace two distinct mindsets and methodologies (i.e., the
core’s mindset of “get it right the first time” and the R&D mindset of risk taking).

Holding dual mindsets was noted as a new but challenging ability.

A custom organization model to address the future as well as current business was forming. The leader was aware of the ambidexterity dilemma and related efforts to extract key people from daily dynamics and prove leadership to coordinate and unify the team. Further, the R&D group was formed for short-term project teams to identify and quickly test numerous ideas for a few strong ones to enter the product development pipeline. Distinct metrics were established for this R&D group (i.e., number of ideas killed so move rapidly to the next possible idea, and amount of unplanned activities intruding on R&D staff’s time). A move to an economic development zone to collaborate with university talent was under consideration.

As a systems house and given the nature of the founders, experimentation was part of the cultural fabric of the company. Building on the LaunchPad experience, they introduced a methodology for early testing with a rigorous learning process that involved customers and cross-functional teams. The new R&D group had commenced an aggressive plan to test hundreds of ideas and engage people throughout the company to utilize their expertise.

**Ambidexterity in Company Charlotte-A.** A compilation of the evidence levels for Charlotte-B (CLT-B) is shown in Table 4.14 and followed by analysis of the input for each aspect of ambidexterity.
Table 4.14

*Charlotte-A Evaluation Considering Aspects of Ambidexterity*

<table>
<thead>
<tr>
<th>Duality/Balance</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/Separate Efforts</th>
<th>Experiments/Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT-A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols: ● Strong, ○ Medium, □ Weak.

Key projects spanned the Innovation Continuum™ as sorted by the President. As sorted by the VP, projects were expansionary but not radical. Together, the projects indicated a moderate balance (see Table 4.15). When allocating project time using Ansoff’s Project-Market matrix, leaders revealed a bias toward current products and markets. The president shared that normally 35% of his project time was spent on existing/existing and 25% on new/new but he had “gravitated back” in a recent “blip” (to 45% and 15% respectively). The VP thought he spent an insufficient amount (20%) of his total time on projects and stated, “my world is very transactional.” He had zero time dedicated to “new/new” which was consistent with his not assigning any major projects to breakthrough/radical projects (see Table 4.16).

Table 4.15

*Charlotte A Interview Exercise: Assignment of Top Projects to Innovation Types*

<table>
<thead>
<tr>
<th>CLT-A Leader/Number of Projects</th>
<th>Evolutionary/Incremental Projects</th>
<th>Expansionary Projects</th>
<th>Revolutionary/Radial/Breakthrough Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Participant 2</td>
<td>2</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 4.16

*Charlotte A Interview Exercise: Allocation of Project Time in Product-Market Matrix*

<table>
<thead>
<tr>
<th>CLT-A: % Project Time/Quadrant</th>
<th>Existing/Existing (Quadrant-a)</th>
<th>New Products and/or Markets (Quadrants b+c+d)</th>
<th>New/New (Quadrant d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1t</td>
<td>45%</td>
<td>55%</td>
<td>15%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>60%</td>
<td>40%</td>
<td>0%</td>
</tr>
</tbody>
</table>

The President shared a frustration that the timing of an opportunity does not line up with the ability to innovation. At time, they thought there “is a little risk involved and we better do what we know will keep the lights on as opposed to roll the dice a little bit.”

A three-year strategy guided the company’s efforts. The project pipeline was unofficial and loosely controlled. The focus was on revenue and the emphasis was on adding new customer and expanding the product line with complementary tools. Some moves into new technologies and market spaces propelled them along their innovation trajectory.

Tension was clearly managed at the top where the big things stayed. The leaders would pull in people with valuable input or who may be impacted. The senior leaders managed the paradox between responding to today’s needs and providing for future development. They made strategic tradeoffs with a mix of real-time resolutions, round-the-table conversations, and “scattering in multiple directions until more data is available.” While the leaders were comfortable working through the dilemma, the President believed that “slowing things down can help reach consensus and avoid fracturing.” In speaking about an innovation that was located in a separate division, the President acknowledged the cognitive dissonance, “It can be a drain on resources about
which one is going to get funded, the tried and true bread-and-butter….business, or this new business that could potentially be much bigger.” The VP was instrumental in converting strategy into assets. As the key implementer, he would create the building blocks necessary based on his deep understanding of the dynamics and desired direction.

Agility was indicated. As a small business, it was essential that everyone “wear many hats.” The VP dedicated serious effort to keeping abreast of the rapidly moving computer industry and listening to customers. Usually, the opportunity presented itself and the leaders responded, and upon later reflection, recognized they had been innovative. There had been trade-offs made to be more conservative which explained the company’s strong foundation. Yet, the VP mused if they might have grown exponentially had they “tried something completely new from time to time.” The agility was a considered responsiveness to customers, technology and market opportunities.

The company created a separate division for a completely different business. Rather than the components for others to develop products, this division develops and delivers end-user products for the unique needs in a specialized industry. For this customer segment, solutions were made available as turn-key systems. The division was known with its own name and had its own website (although it was located in the same building as the company). This division had achieved early and significant successes.

Learning was seen as essential in terms of keeping abreast of the computer industry and the technical aspects of the products. The area of experimentation was not mentioned in the responses.
**Ambidexterity in Company Charlotte-B.** A compilation of the evidence levels for Charlotte-B (CLT-B) is shown in Table 4.17 and followed by analysis of the input for each aspect of ambidexterity.

### Table 4.17

*Charlotte-B Evaluation Considering Aspects of Ambidexterity*

<table>
<thead>
<tr>
<th>Duality/ Balance</th>
<th>Alignment</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/ Separate Efforts</th>
<th>Experiments/ Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols: ● Strong, ○ Medium, ○ Weak.

Projects spanned the Innovation Continuum™ as sorted by both leaders and indicated a strong balance dyad (see Table 4.18). When allocating project time using Ansoff’s Project-Market matrix, leaders revealed opposite biases, potentially a complementary dyad (see Table 4.19).

### Table 4.18

*Charlotte B Interview Exercise: Assignment of Top Projects to Innovation Types*

<table>
<thead>
<tr>
<th>CLT-B Leader/Number of Projects</th>
<th>Evolutionary/ Incremental Projects</th>
<th>Expansionary Projects</th>
<th>Revolutionary/Radial/ Breakthrough Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Participant 2</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Average</td>
<td>2.5</td>
<td>2.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

145
Table 4.19
Charlotte B Interview Exercise: Allocation of Project Time in Product-Market Matrix

<table>
<thead>
<tr>
<th>CLT-B: % Project Time/Quadrant</th>
<th>Existing/Existing (Quadrant a)</th>
<th>New Products and/or Markets (Quadrants b+c+d)</th>
<th>New/New (Quadrant d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>75%</td>
<td>25%</td>
<td>5%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>30%</td>
<td>70%</td>
<td>40%</td>
</tr>
</tbody>
</table>

There was clearly strong emphasis on both improving today’s capabilities and pursuing future opportunities, supporting comments included:

- “Our company is wired for a constant flow of 1% continuous improvement in all service offerings.”
- Backlog of ideas for “the experience” that differentiates.
- “We recognize that technology is changing our industry… now software can replace us….So how do we diversify to protect ourselves….There are things that we’re doing for that.”
- Frequently, the impetus for ideas is the “pebble in your shoe,” leading to big, bold innovations. “Pushing technology to its limit allowed us to compete with the big boys.”

There was clear concern about fully engaging the full team. While the leaders were enthusiastic about the potential of technology changing the offerings, they recognized that their product is through people, supported by people. Further, the COO’s quarterly one-on-one meetings with each employee provided a means for assessing the degree of buy-in and gathering opportunities for improvement.
The leader dyad held the tensions between providing excellent services today and shifting for breakthrough ideas. They worked closely discussing the “problems and pains” within the firm and in serving customers. Idea creation whether it came from one leader or the other, required “a lot of interaction; as one leader described it, “So we are playing off of each other’s ideas and challenging each other.”

The company’s business model was “literally always changing,” including diversification efforts. In the early years, the COO focused on profitability and growth by creating systems and processes. Then he shifted his efforts to how to leverage the company’s unique abilities of international strengths. At one time they had over a thousand employees but shifted to a small core of full-time employees with a network of contract employees and operated virtually utilizing technology. One department was undergoing a reorganization to change the customer experience and increase capabilities for growth and future differentiation. At the same time, the company received its largest contract to deliver with a tight deadline.

The different lines of business staffed by people around the world have been managed from leadership in the home office. Most recently, a radical idea emerged and the business model was so distinct that the owners were advised to launch it as a separate business and have one of the owners be dedicated to leading it full time. Linking mechanisms would be ensured by the ongoing interactions of the leader dyad.

The company had a history of experimentation, increasing when the second owner purchased a large share of the business and then became COO. In his words, “We’re comfortable failing as long as it doesn’t kill us. So we started doing experiments and we keep doing experiments.” He provided a rich sample of examples during the interview.
**Ambidexterity in Company Charlotte C.** A compilation of the evidence levels for Charlotte-C (CLT-C) is shown in Table 4.20 and followed by analysis of the input for each aspect of ambidexterity.

Table 4.20

_Charlotte-C Evaluation Considering Aspects of Ambidexterity_

<table>
<thead>
<tr>
<th>Duality/Balance</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/Separate Efforts</th>
<th>Experiments/Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT-C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols:  ● Strong,  ○ Medium,  ○ Weak.

Projects spanned the Innovation Continuum™ as sorted by the CEO covered the Innovation Continuum™ but skewed to evolutionary projects. The VP’s card sort showed an imbalance towards evolutionary and expansionary (see Table 4.21). When allocating project time using Ansoff’s Project-Market matrix, both leaders showed greater time spent on projects with some aspect of new (products, markets, or both) than on existing/existing (see Table 4.22).

Table 4.21

_Charlotte C Interview Exercise: Assignment of Top Projects to Innovation Types_

<table>
<thead>
<tr>
<th>CLT-C Leader/Number of Projects</th>
<th>Evolutionary/Incremental Projects</th>
<th>Expansionary Projects</th>
<th>Revolutionary/Radial/Breakthrough Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Participant 2</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
### Table 4.22

*Charlotte C Interview Exercise: Allocation of Project Time in Product-Market Matrix*

<table>
<thead>
<tr>
<th>CLT-C: % Project Time/Quadrant</th>
<th>Existing/Existing (Quadrant a)</th>
<th>New Products and/or Markets (Quadrants b+c+d)</th>
<th>New/New (Quadrant d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>35%</td>
<td>65%</td>
<td>30%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>30%</td>
<td>70%</td>
<td>10%</td>
</tr>
</tbody>
</table>

The leader began with an operations focus when co-founded the company and later shifted to strategic with the help of an executive coach when he became CEO. Recently on advice of equity partner, CEO expanded his time horizons from one year to three to five years. He had been vigilant about what’s going on in industry as compared to company’s capabilities. Yet, he made sure moves into new technologies were related to the company’s foundation of being reliable and competitive. He held two decision trees. One was for precision of tactical decisions. The other was for strategic decisions, permitting him to take risks and place bets, and move forward with 80% certainty. The VP related that sales brought ideas regarding “latent pain” and sales engineers discerned emerging needs, thereby providing ideas of various innovation types.

The CEO emphasized the company values which were reinforced frequently. One was openness, a clear leadership trait of the CEO. He believed that everyone was a critical piece of the puzzle. He used that metaphor along with the company’s one-page strategy to link all efforts and fostered strong ownership and alignment. The VP saw the company culture as an asset for innovation in that everyone was on board with the company mission and there was a “total team approach.”

The CEO’s strategic advisory team was active in addressing a range of issues. How tensions were resolved regarding resource contentions between projects for today’s
profit and future horizons was unclear. The VP of Product Development stated that his biggest challenge was that the day-to-day demands trump projects and his project managers were not able to reprioritize the time of others to support new products and innovation.

Agility was evident as related in both interviews as well as the significant growth into many markets in less than a decade. The ability to form strong relationships with employees, customers, suppliers, and equity owners supported the rise through startup and into strength. While gaining scale for profitable growth, efforts were also focused on making sure it maintained the CEO’s priority that the “interface with the customer is still handled in relationship.” The VP credited the company in being nimble and agile as well as ensuring customer satisfaction through the growth but recognized the strain on people on the “back-end” where better process definitions were lacking. Recently, the company began shifting its talent needs to meet the changing marketplace and technology.

Addressing continual delays in derailing project work due to the demands of service delivery, product development efforts were split off into its own, small group. This group created a product roadmap and had three service architects who had the “impetus to innovate and move forward.” There was a defined flow for projects that were staff by interdisciplinary teams.

Responses related to experimentation were few. Technical people worked closely with the large suppliers, testing the depths of the capabilities of their technologies. Experimentation was done as technical reviews, lab demos, and customer Beta sites. On occasion, they would hire outside experts to assist such as with a piece of a customer interface.
**Ambidexterity in Company Charlotte-D.** A compilation of the evidence levels for Charlotte-D (CLT-D) is shown in Table 4.23 and followed by analysis of the input for each aspect of ambidexterity.

Table 4.23

*Evaluation Considering Aspects of Ambidexterity: Charlotte-D*

<table>
<thead>
<tr>
<th>Duality/Balance</th>
<th>Alignment</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/Separate Efforts</th>
<th>Experiments/Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT-D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>Medium</td>
<td>Weak</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols: ☑ Strong, ☐ Medium, ☐ Weak.

Top projects spanned the Innovation Continuum™ as sorted by the CEO covered the Innovation Continuum™ but skewed to evolutionary projects. The VP’s project card sort showed imbalance towards evolutionary and expansionary although he noted one project had the potential to be radical with new clients and capabilities (see Table 4.24).

When allocating project time using Ansoff’s Project-Market matrix, the CEO apparently attended to top projects in existing domains and spent even greater time with projects with some aspect of “new” (products, markets, or both). Most of the VP’s project time was spent on “existing.” (see Table 4.25)

Table 4.24

*Charlotte D Interview Exercise: Assignment of Top Projects to Innovation Types*

<table>
<thead>
<tr>
<th>CLT-D</th>
<th>Evolutionary/Incremental Projects</th>
<th>Expansionary Projects</th>
<th>Revolutionary/Radial/Breakthrough Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader/Number of Projects</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Participant 1</td>
<td>3</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Participant 2</td>
<td>4.5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.25

*Charlotte D Interview Exercise: Allocation of Project Time in Product-Market Matrix*

<table>
<thead>
<tr>
<th>CLT-D: % Project Time/Quadrant</th>
<th>Existing/Existing (Quadrant a)</th>
<th>New Products and/or Markets (Quadrants b+c+d)</th>
<th>New/New (Quadrants d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>40%</td>
<td>60%</td>
<td>10%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>65%</td>
<td>35%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Other considerations regarding deliberate efforts to exploit current capabilities and explore future opportunities include:

- The CEO maintains concurrently three perspectives: product (improvements), professional services (efficiencies), and customer (innovations).
- The innovation leadership team consisted of people matched to Innovation Continuum™: pure innovation, translation of theoretical ideas into practical., and implementation into mass production.
- The CTO’s group represented 25% of the company resources and 50% of his mindshare was devoted to innovation, typically seeking new ideas.

In the area of alignment, the CEO played an “evangelical role” in focusing employees on customers and innovation efforts to customers reach their goals. He believed that if a leader espoused and furthered innovation, then the company would follow. The VP of Operations led a major effort entering the world of software as a service (SaaS) and made sure everyone understood the changes and no one felt left out.

Tension was clearly held by the senior leadership team. The tension between today’s needs and future viability were summarized by the CEO who said his biggest driver was “care of the customer’ and his biggest fear was “becoming obsolete or
irrelevant.” He called it a constant “tug of war.” He realized that as a company gets larger, more processes for consistency were necessary but lamented that they increase response time. Much debate happened among the executive team with the CEO and CTO in constant contention on radical ideas and the CEO and COO on speed versus careful execution.

The CEO had devoted significant energy to develop a type of agility needed for innovation. He saw his role to be creating an environment of innovation, dialoging to generate new ideas, learning from the market space by listening. He encouraged employees to take the customer to the next level. He recognized the need to be ready for new technologies and “innovative ways of thinking” that would rise from other parts of the world.

There was no evidence of a custom organization model to support the duality. Instead, according to the CEO, “There is a push to innovate everywhere” and “pet-project efforts that spring up on the side” were nurtured. People showed passion and experience when they were thinking out of the box and some of these pet projects became successful and celebrated. Evidence of experimentation was the dynamic described as innovation team discussions leading to prototypes, experimentation, production, and then presentations to customers for feedback.

**Summary of Findings.** Evidence found across all companies created a striking picture. The results of all companies using aspects of ambidexterity are summarized in Table 4.26. Averages for each aspect were calculated by assigning points to each level of degree.
Table 4.26

_Evaluation Considering Aspects of Ambidexterity: Summary of all Companies_

<table>
<thead>
<tr>
<th></th>
<th>Duality/Balance</th>
<th>Alignment</th>
<th>Tension Held at the Top</th>
<th>Agility</th>
<th>Custom Models/Separate Efforts</th>
<th>Experiments/Rigorous Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROC-A</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>ROC-B</td>
<td>★</td>
<td>○</td>
<td>★</td>
<td>○</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>ROC-C</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>CLT-A</td>
<td>○</td>
<td>○</td>
<td>★</td>
<td>○</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>CLT-B</td>
<td>★</td>
<td>○</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>CLT-C</td>
<td>○</td>
<td>★</td>
<td>○</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>CLT-D</td>
<td>○</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Avg.</td>
<td>2.43</td>
<td>2.43</td>
<td>2.86</td>
<td>2.71</td>
<td>1.43</td>
<td>2.29</td>
</tr>
</tbody>
</table>

Degree of evidence represented by symbols: ★ Strong=3, ○ Medium=2, ○ Weak=1
Average degree of evidence: ★ Strong=2.5-3.0, ○ Medium=2.0-2.5, ○ Weak=1.0-2.0

All companies had strong evidence in at least two of the aspects of ambidexterity, but no company was strong in all aspects. Two companies had five aspects that were strong, with the sixth aspect being either medium or weak. A third company had four strong aspects and two medium. The remaining four companies had aspects ranging from strong to weak.

The aspects with the most consistent strong evidence were “tension held at the top” (six strong, one medium) and “agility” (five strong, two medium). These two traits are commonly associated with startups and younger companies but not necessarily as defined in terms of ambidexterity as was done for this evaluation. In each of the other
aspects, the evidence ranged from strong to weak. In “Duality/Balance” (four strong, two medium and one weak), awareness of the ambidexterity dilemma was clearly present across all companies and some were actively engaged in creating a balance. “Alignment” also varied across the companies, particularly as a goal to enable innovation. Evidence for “exploration experimentation for rigorous learning” was strong in four companies where the intention was to expand learning for the purpose of moving the company along its innovation trajectory. “Separate efforts/Custom models” to support the duality of challenges for current versus future projects was the weakest area of all aspects. There were, however, some custom models such as a variety of ad hoc teams, focused departments to guide the organization, and two instances of separate business units.

**Summary of Research Question 1.** Based on the interviews, evidence of ambidextrous leadership is clearly present in SMEs, but in an emerging form. Ambidextrous leadership was seen in the forms of the leaders themselves, the leadership teams, and the organizations. Some aspects, such as “agility” and “tension held at the top,” appeared to come more naturally to SMEs than large, established business. Yet, other aspects, such as “a custom business model,” seemed to be emerging more organically. Ad hoc teams and organization trials were attempts to tackle the challenges both of growing a young company plus managing the duality of exploiting efficiencies for profits today and exploring new products and services for future viability.

The following question shifts to asking how the leaders approached innovation with emphases on implementation and ambidextrous leadership. Qualitative analysis continues but takes the form of inductive content analysis since the nature of the
investigation is about “how” senior leaders in SMEs advance their companies’ innovation efforts.

Research Question 2: In seeking to advance an organization on its innovation trajectory, how do senior leaders of SMEs ensure the capabilities both for exploiting current innovation and continuously exploring future innovations? The second research question investigated senior leadership’s efforts to advance the organization along its innovation trajectory. Particular emphasis was placed on how senior leaders ensure capabilities for innovations to fulfill dual purposes – exploiting today’s innovations for customer satisfaction and profits as well as exploring future innovations for new products, customers, and business models. The focus of the inquiry was on “how,” seeking common themes, variations, and breakaway efforts. The semi-structured interviews were guided by six questions. Responses used in the qualitative analysis flowed directly from four open-ended questions (i.e., personal leadership in the innovation trajectory, effective means to achieve innovation and frustrations, regional supports and challenges, and personal approaches to managing projects along the Innovation Continuum™), and indirectly from two questions (i.e., projects sorted into time horizons and along the Innovation Continuum™, and time allocation using the Product/ Market matrix). Questions were explored more deeply in the follow-up calls for additional detail and clarifications.

Inductive data analysis was guided by Creswell’s (2009) approach to build patterns, categories, and themes from the bottom up organizing data into “increasingly more abstract units of information…working back and forth between themes and the database until the researchers have established a comprehensive set of themes.
Specifically, the analysis for question two involved content analysis of the fourteen interviews along with initial communications, follow-up calls, responses to interview summaries, and subsequent e-mails. The content was taken one participant at a time. The coding process was guided by Creswell (2009) and followed steps commonly used for qualitative analysis, starting by dividing the text into chunks and labeling with paraphrases as well as phrases and paragraphs “in the actual language of the participant (called an in vivo term)” (p. 186). The data were captured onto Post-It® Notes which were affixed onto a tri-fold poster board. When all fourteen interviews were complete, there were over 200 Post-It® Notes. Data were taken two-by-two from each company. Commonalities emerged for each company pair. When two companies were completed, their data were merged seeking patterns and categories. The Post-It® Note codes for each subsequent pair were folded in and categories gained higher levels of abstraction and began to form themes. Adjustments were made throughout the process. When all codes were accounted for and mapped into groups (with approximately 5% not finding meaningful placement), each category was reviewed with modifications made to recast, merge with other categories, and shape into themes and sub-themes.

Seven themes emerged:

1. SME’s senior leadership team as the nexus (core and connectors). “The pillar that each person brings.”
2. Intense customer focus that abides through the growing pains. “Journey mindset with the customer.”
3. Emerging organizing mechanisms in SMEs in growth phase. “Yin and yang.”
4. Relentless learning and experimentation. “Iterate and learn.”
5. Efforts to provide, protect, and nurture resources for exploring an uncertain horizon. “We set up a separate group with the impetus to innovate and move forward.”

6. Agility and pivots as part of dynamic capability. “Making it unstable was a conscious decision. So we could build to the next level, we had to be flexible and nimble to support higher demand and complexity.”

7. Tapping environmental munificence starting local and growing to transcend borders. “Charlotte is a business-friendly place as long as you know where to look...and have the mentality.”

**Theme 1: SME’s senior leadership team as the nexus (core and connectors).**

The topic of innovation leadership led to discussions about members of the senior leadership team. Comments made about the person’s natural talents and orientations were as frequent as points about particular skills and roles, and typically made more emphatically. Most CEOs were highly aware of leveraging differences among members of their senior leadership teams. The senior leadership team itself was credited as a source of many of the innovation ideas. Difficulties associated with managing the duality paradox was mentioned frequently, particularly by the CEOs.

As related to sustaining innovation, a general model emerged when considering four of the seven companies. In this model, the senior team leveraged differences first in recognition, then in role allocation, and most significantly in the rhythms for collaboration and creativity. Role descriptions shifted somewhat with company growth and resource availability, typically moving to closer alignments with the leaders’
preferences as well as their strengths. The four companies that fit the general model are described below.

The first fitting this model was one company with a co-founder triad from inception. While technical skills and entrepreneurial backgrounds were similar, the talents and preferences were complementary yet clearly distinct. These leaders formed a highly effective senior leader triad with high mutual trust. As described by the CEO, “The three of us are generally able to bring forth something that’s truly innovative, is conceptually practical, and can actually be delivered … the pillar that each person brings.” The COO credited their success to being rich in talent and by being closely knitted together and spoke as if it unfolded naturally as if by fate, “We didn’t choose it; it chose us.”

The second company fitting the model was led by a co-founder dyad. The dyad also depended greatly on a highly respected VP of operations for counsel and implementation. The mix of the three has proven to be highly effective in their business context. The CEO and President dyad made the strategic decisions jointly while the VP listened intently and offered data and considered opinions as needed. The CEO was the primary innovation thought leader, often taking specific customer requests and generalizing a solution to be useful broadly. The President articulated the decisions to “the troops.”

In the third company fitting the model, the CEO served as the center of a diverse executive committee, described as consisting of almost an even mix of Pioneers and Builders (using terms from the ISPI™). The Pioneers looked for new tools and the means to keep in front of the market while, at the opposite end, the Builders managed with rules
and data. Collaboration and decision making appeared to take a hub-and-spokes form, with rarely the need for the CEO to be the tie-breaker.

In the fourth company fitting the model, the innovation roles were delineated with senior leaders assigned: the CEO (strategy, product gaps), the CTO (pure innovation), the VP of Operations (implementation), and the Director of Product Strategy (practical innovator). The CEO placed each member along the Innovation Continuum™ with himself best suited and most comfortable with expansionary efforts. He and the CTO have a “lovely relationship” with strong trust and “constant contention on radical ideas.” Collaboration is high. The CEO related that he asks many questions to push for deeper thinking, challenges evolutionary efforts to go faster, and inquires how revolutionary ideas can have broader in impact.

Two companies displayed variations of the general model and the last maintained a traditional model. One variation was a dyad of the founder and COO (co-owner) who formed a highly complementary, tightly-coupled senior leader team. Instead of diversifying and leveraging differences by adding senior members, they had engaged outside experts as needed in their efforts to grow, diversify, and change business models. They related several instances when they pulled in such outside talent to expand or clarify their thinking and deliver additional skills. Consistent with the company’s move to growth through a virtual network of staff, they had created a leadership model to challenge and support their efforts. Another variation was a company transitioning from a hierarchical model with the founder as primary visionary, system creator, and problem solver to a collaborative model with shared leadership. The decision to hire someone to take on the role of President & CEO was made to reallocate aspects of leadership to
someone with distinct skills and preferences. The final company had a traditional leadership model yet relied on clear company values and strong relationships to encourage collaboration and maximize performance.

Most of the senior leadership teams remained the key source of idea creation (participants in six companies indicated as top source). One COO stated he was still a primary person for innovation and process improvements given his deep knowledge, especially across departments. He thought his involvement across the company provided an ideal vantage point, “So much of innovation has really been two things crossing that don’t normally cross.” One CEO was the company visionary, looking over the horizon for where the industry is heading and what products are needed as enter the unfolding of the industry’s “Renaissance.” He shared that he generates ways to “revolutionize the problem” into something new and then hands it over to others who were better suited to implement the ideas; he credited them as “a great team that finally understands my madness.” In one team dyad, idea creation, whether coming from one or the other, required “a lot of interaction to really develop it, so we are playing off of each other’s ideas and challenging each other.” This constant thinking and talking about persistent problems leading to innovation was a common thread among all senior leadership teams.

Efforts to manage paradox at the senior level were evident in all companies, but took varied forms. Leaders spoke of tensions related to their cognitive dissonance and their approaches to work toward balance of projects. One CEO said he remains active in facilitating the process of what to deliver next. He sets priorities by considering customer requests, operational needs, and the voice of the technology team and translating those multi-faceted demands into what is “business-critical.” In another company that tended
to favor “the new and shiny stuff,” leadership had been working to strengthen implementation and support capabilities including hiring talent to manage the details. Another CEO, in speaking of the tensions between today’s needs and future viability, revealed “a constant tug of war” between his biggest driver, “care of the customer,” and his biggest fear, “becoming obsolete or irrelevant.” He stated the ideal balance would be sufficient work and focus on innovation, but currently too much was spent on infrastructure to keep the ball moving. He held concurrently three distinct perspectives: improvements of current products, efficiencies in professional services, and future innovations for customers. Finally, another senior team was laying the groundwork to prepare the current businesses to operate smoothly and more autonomously so that one senior leader could move over to launch a radical service, separated from the core business. While the paradox associated with ambidexterity was manifested differently in each company, in each case at least one participant of the senior leadership team was acutely aware and highly active in managing the difficulties associated with building capabilities for both today and the future.

**Theme 2: Intense customer focus that abides through the growing pains.** Most senior leaders emphasized an intense customer focus when asked about the drivers, sources of ideas, and criteria for prioritizing its innovation efforts. One company with a complex scientific service offering captured its innovation purpose simply by stating, “We’re constantly innovating and improving so we can deliver better service to our clients.” Another company (CLT-A) had growth by innovating across the marketing mix as it recognized and responded to distinct customer sets and grew its specialized product offerings to enter new market spaces. Ideas here came from customer requests, and
priorities in the product pipeline were set based on potential for growth. It was rarely an early adopter of technology but instead focused on expanding its products and market segments in response to unmet customer needs.

Several leaders demonstrated their intense customer focus through their senior team and company-wide efforts. One CEO had changed the company’s focus from products and services to the customer’s whole-company experience. He began to dedicate leadership meetings to providing customers with better and more value-added experiences. He related being “evangelical” in focusing employees on taking the customer experience to the next level and on innovation efforts to help customers reach their goals. Similarly, another CEO was pursuing ontological efforts to inspire employees to embrace a “journey mindset with the customer… to generate loyalty by giving the spectacular.” A third CEO was emphatic about directing employees’ excitement about technology to its potential for solving customer problems. He praised the small group of forward-looking service architects, “They get it!” He went on to describe the challenge of innovating to grow by improving scale and standardizing and still making sure the “interface with the customer is still handled in relationship.”

Most leaders indicated innovation coming from customer ideas. One leader noted that innovations were based on input from customers and matched with technology trends to enter somewhat early, “at the cutting edge but not the bleeding edge.” By offering strategy workshops, this company was able to keep abreast of emerging needs while providing clients guidance on ideation and building product roadmaps. These workshops were counted as “one of our secret formulas.” With larger size often came distance from the customer, and two companies were taking actions to strengthen the customer
connection. One planned to hire a VP of Product Strategy who would be responsible for gathering customer ideas. Another had asked its new research and development (R&D) group to spend more time listening to customers. Its CEO saw a strong need for “closeness with the customer where we can get good feedback about what’s the right product for us to develop.” He was planning a powerful portal to create a virtual closeness.

Resource allocation was tangible evidence of commitment to customer focus. With little slack resources to set aside to innovate for the unknown, most companies clearly put current customers first. Speaking plainly, one leader stated, “Delivering what we’ve promised, keeping our word, and taking care of our customers is where we allocate all of our resources until that’s done, and then we’re allocating resources on the revolutionary stuff” Another related its first lens of prioritization was relationship and revenue, with the second being cost and productivity. Contentions were resolved more on customer-pull than on a scientific basis; customer relationships “always get a star on the list.”

This intense customer commitment shifted in some ways as the companies grew and sought new horizons. Some indicated they had stepped away from accepting every customer request in order to achieve scale needed for growth. One company instituted a requirement for senior approval for customer requests that would impact the project plan. Another leader reviewed how resource conflicts were resolved based upon strategic value, weighing urgency versus importance. He shared they were willing to “take a couple of bullets to execute the more important thing, if we know we can survive the hit.”
These caveats were not meant to say that customers were no longer at the center but that other considerations had joined them on stage.

**Theme 3: Emerging organizing mechanisms through the growth phase.** Across the companies, a number of mechanisms were in various stages of development and implementation to manage growth and move the organization along its innovation trajectory. Some leaders mentioned setting up formal processes to organize a flow of project candidates for management approval and prioritization in a project pipeline. For instance in one company, management met monthly on product strategy with open discussions on priorities, company direction, and things to stop doing. A recently-established process translated the strategy and priorities into a product roadmap with projects slotted into categories: maintenance, customer-driven, and innovation. A company-wide communication effort increased alignment. The realistic timelines and focus on excellent execution were seen as significant improvements from the previous approach, described as “bam, bam, bam, trying to know all this stuff out.” To enhance capabilities, operations leadership began holding off-site meetings to work on “big, meaty” topics quarterly. Senior leadership learned to “prioritize the change” so the organization could move forward fast but not risk doing a poor job.

One leader likened the balance between current and future work to a “yin and yang” dynamic between the three-year roadmap and the next release. Although the roadmap shifted due to emergencies on occasion, he saw improvement, “We now have more definitive long-term priorities that we know need to be delivered up.” The work took shape as strategic big-block projects rather than ongoing fire-fighting. Another leader saw progress in the recent formal process for creating product pipelines with
structured rapid-research projects, formally approved for priority. A third example was a routine used by a senior leadership dyad. The cycle began loosely in idea creation whenever the inspiration would hit and moved to structured brainstorming, and then remained in the “parking lot” with its documentation. Later at a more formal decision-making time, the leaders looked at “these shiny things” against the strategic plans, adding high-priority projects to the innovation portfolio to be defined with plans and action items.

A wide range of techniques and approaches were described to support leadership’s effort to be deliberate. One CEO invested great effort in creating a one-page strategy with four areas, each with four initiatives so that all groups could tie their efforts to the strategy. For the initiatives on the frontiers, he asked the groups to determine how to get there. Another CEO described a host of techniques adopted from Toyota for improved strategy efforts, meeting effectiveness, and resource allocation. His organization had built the capability to get ideas and complaints known and resolved rapidly, pre-empt fiefdom building, and ensure flows of pure information to senior leaders. The process intended that all cross-functional issues go to the senior team for resolution.

Another company utilized two types of meetings to serve distinct purposes. Monthly research and development meetings (“top down”) were focused on the science and external requests, weighted to the longer term. Innovation meetings (“middle up”) were focused on clients and continuous improvement for scalability.

Leaders from two companies shared departures from continual customizing to meet customer requests in order to scale. One stated, “At this size, we need to be more
process-oriented and scale-oriented, a little more rigid around definition..., roles and responsibilities, criteria.... Make decisions where we might turn down a customer.” In the other company, the decision to stop customizing impacted job skills and implementation processes. That leader devoted significant effort to making sure everyone understood and reinforced the change project-by-project.

**Theme 4: Relentless learning and experimentation.** Learning was mentioned as key by leaders in all companies. In six companies, one or both leaders expressed commitment (ranging from strong to zealous) to experimentation, viewed as essential to learning. In two companies, the nature of experimentation was evident within the organizations themselves. In the first company, there was “a push to innovate everywhere.” The leadership nurtured the pet projects that would spring up “on the side,” with some becoming successful and celebrated. The leader recognized additional benefits in that “people show passion and experience in thinking out of the box.” In an environment that encouraged curiosity, innovation often took a form he called “evolutionary breakthroughs,” led by possibilities rather than by innovating true technology on its own. For example, tinkering with Cloud technology provided knowledge that the approach would be relatively easy to adopt, and when coupled with customer interest, this company created a new strategic pathway.

In the second company there seemed to be a culture of disciplined inquiry. The leader described a probing mindset:

What we do to make ourselves effective and more efficient is really to change the rules of the game we are playing.... We typically look at what’s not working and what is the belief or understanding that is present
that doesn’t allow us to achieve the effectiveness or efficiency we would like.

Further, he encouraged the “language of possibility” to keep things open, “not in a box,” and to avoid eliminating possibilities inadvertently with improper problem definition. People are encouraged to learn from everything, including how to design the problems better so future efforts would afford greater learning potential. People were trained to value all experimental outcomes by tracking their discovery processes so the effort would be repeatable and transportable. In this setting, initiatives came from throughout the company and willing people were allowed to champion their ideas. Successes were adopted and the master process was amended with those proven through experimentation.

A few leaders shared their personal philosophies and revealed their own expanding comfort zones. Two leaders were serial entrepreneurs, with predispositions embracing experimentation and failure. One summarized his attitude, “We’re comfortable failing as long as it doesn’t kill us. So we started doing experiments and we keep doing experiments.” The other attributed progress to the approach of “iterate and learn.” The company had many successes and also “spectacular failures,” but the key was to “learn from them and keep iterating and trying.” A third leader, whose education and early experience had been in large corporate settings, shared his change of attitude and expectations. He learned the “first couple passes are going to be most likely a total pancake but that shouldn’t deter you from the path. Some type of progress has been made…..It’s unpredictable by nature and you should embrace it.” He saw the data from the experiments as more important than the success or failure of the experiment. He modeled the mindset of “failure is awesome.” If something is disproved, “Great! You
avoided implementing a horrible process.” These mindsets were particularly activated when discussing exploring uncertain pathways.

Leaders from three companies described experimentation efforts conducted early in the process. One leader singled out experimentation as the key to innovation and described the essential elements, “The single biggest organizational capability ….is the rapid prototyping, rapid iteration where we work both the technology as well as the customer in parallel.” Experiments are evaluated post facto rather than comparing outcomes to a pre facto theory. If proven, they move forward and scale it. Otherwise, they iterate to test the next approach until they can develop a “minimum viable product” to test usefulness with existing customers. If customer engagement faltered, development ceased until active again. As a result, they entered the formal research and development phase with a proven prototype and real customer interest. This approach allowed them to match discovery with real demand and protect scare talent and financial resources. Several aspects of this approach are found in “lean methodology” being taught in a variety of settings such as programs offered by incubators.

One company had participated recently in such a program called LaunchPad offered by High Tech Rochester (HTR). For twelve weeks, a cross-functional team learned and followed a new approach for a pre-stage of product development including steps for customer input, concept prototype, customer reaction, alterations, and field-test with customer validation. The experience proved successful and the company was adopting this rapid and iterative process (i.e., early testing with rigorous learning, early customer involvement, and cross-functional teams) with teams assembled from across the company and led by members of R&D.
In Charlotte, the learning efforts in one company relied on rigorous effort and strong relationships. The technical people maintained deep understanding of most of the current technology, reinforced by close relationships with the big technology companies to understand and use advancements. The CEO praised his team, “Our guys really care and they run things through not once, not twice, but three times to make sure… dig in… and understand.” On occasion when wrestling with experimentation, they have used third parties for analyses or studies (e.g., part of a new customer interface). This learning from outside efforts has been fruitful. The leader’s view was that the needed insights were “typically not unique, someone has delved into, at least on the perimeter.” This relentless learning knew no boundaries.

**Theme 5: Efforts to provide, protect, and nurture resources for exploring an uncertain horizon.** There was high variability in approaches to providing resources for exploration. Philosophically, most leaders were somewhat aligned. They recognized the distinct nature of exploration work and were comfortable initiating strategic action without complete certainty.

One leader articulated the distinction. Continuous improvement projects were focused and planned, with strict timetables and high certainty. In contrast, breakthrough projects required iterative processes, loose pacing and less pressure, conditional efforts, and acceptance of the likelihood of failure. This leader had learned to shift between the two project types and became comfortable with the uncertainty of breakthrough work, “I think it’s like biology; it’s unpredictable by nature and you should embrace it.” Furthermore, several leaders spoke of moving into new strategic arenas without the high certainty required for incremental or tactical decisions. One leader related that although
his business was one of precision for tactics, he used a different decision tree for the strategic. He would risks, place bets, and move forward with 80% certainty. Similarly, another leader spoke of creating a new paradigm with infrastructure and process trials, and then when the solution was 60% in place, he would introduce it and improve it over time with sustained effort.

Beyond an overarching philosophy, approaches to providing, protecting and nurturing resources splintered into various types. In two companies, departments had been pulled out of current operations in order to guide and facilitate innovation. One leader explained the formation of a separate product development department by noting that service delivery operations had always “trumped” products and intentions to devote time to think creatively were continually derailed. His new department was charged with creating a product roadmap. The small staff included three service architects who had the “impetus to innovate and move forward” by using their diverse technology perspectives and styles to challenge one another to get the best ideas. Another leader had a similar account of the formation of a separate, small R&D department. He put it as trying to overcome the past of resources going to the squeaky wheel and putting out the latest fire. By separating and building R&D capability, the goal was to review ideas by the hundreds in order to generate a few ideas to enter formal development (key performance metric of “number of ideas killed” so move quickly to next, possibly better idea). Yet after a year in place, the small department faced continued distractions from current operations (and had added a metric for “amount of unplanned activities” for evaluation). This leader indicated his biggest frustration was unplanned activities, citing it as the biggest cause of missed deadlines. All project and customer needs pulled from the same talent pool.
Several leaders related pursuing innovation with ad hoc project teams. Some referred to them as “skunk teams” (adopting the term “skunk works” for groups working on advanced projects with high autonomy and low bureaucracy) or “tiger teams” (referring to groups of imaginative experts formed to investigate a technical problem). They were often cross-functional, interdisciplinary, and inter-market. Team leaders came from the executive committee, the R&D group, and product management. One company assigned teams a specific focus to take through a defined project flow and then disbanded them. In another company the teams of part-time people did the work using “magic time,” and if the project were approved for development, people would then be assigned using “allocated time.” Projects exploring potentially breakthrough innovation were divided into “mini-experiments.” Even if these tasks were not on the project list, “people found a way to prioritize those” because they were interesting or fun. Some had become “big successes.”

Yet, there were cases of companies whose innovation resources did link to form a critical mass of dedicated talent. In one company, the organization led by the chief technology officer (CTO) comprised 25% or the company’s employees. He was said to spend 50% of his mindshare on innovation, seeking new ideas. At the time of the interviews, this CTO was on a one-month “imagination trip” to two continents for customer meetings and general thinking. Another company had a “deep scientific bench” which had created significant differentiation. The scientists’ efforts in publishing, setting up partnerships, and sitting on key boards had afforded insights into how industry leaders were thinking and how to help customers in planning.
In discussing resource allocation innovation among projects, a few leaders reflected on aspects relating to the startup culture. One leader explained that alignment was more common in a small company than in large corporations. Another leader admitted the existence of competition for resources, but not “tension.” Everyone had the same goal simply stated as, “Deliver current jobs and develop products for next year.” Discussion and planning were sufficient to resolve conflicts. Another leader shared that people held onto the startup culture and felt the need to be making an immediate contribution. In the past, assigning people to exploratory projects full time seemed to put them in a position of justifying their work with their peers. People seemed happiest working on a balance of continuous improvement and breakthrough projects, but a balance with more weighting to active roles on immediate projects (i.e., similar to Google in its early years). Recognizing the distinct skill sets required for projects at different ends of the Innovation Continuum™, he estimated that one-third of the employees had both sets and believed they would relish the opportunity to do experimental work also. A third insight was from a leader who acknowledged his own time allocation challenges. He shared that entrepreneurs usually were not “good delegators.” He admitted his need to shift incremental efforts to others and protect his own efforts on exploring future projects.

There were two instances of companies setting up separate business units. One company created a strategic business unit to provide specialized data products and solutions for a specific industry. It used a distinct name and established unique customer interfaces. Another company had just recently created a breakthrough idea requiring a radically different business model. After much deliberation and on the advice of a trusted consultant, they decided to create a separate business unit to provide a “forced focus”
with dedicated people, in a separate facility for “energy protection.” The plan was one
owner would be fully dedicated to launching and leading the new business. Connections
between the new and current businesses would be ensured by the owners’ ongoing
discussions plus meetings and events for the entire company.

Theme 6: Agility and pivots as part of dynamic capability. Leaders of these
technology-oriented companies were acutely aware of the need to adapt within their
rapidly changing industries. They addressed various aspects of the sensing, seizing, and
reconfiguring components of dynamic capability (O’Reilly & Tushman, 2008). Naturally,
they used terms and examples of their own lived experiences and spoke of leadership,
strategy, and company culture. “Agility” and “pivot” were two such terms. Examples
tended to revolve around cultural components associated with ensuring agility and
orchestrating pivots.

In speaking of moving the organization along its innovation trajectory, the leaders
described capabilities to move quickly and adroitly. One company was making deliberate
efforts to increase agility. In hiring someone to assume the role of president, the founder
would be able to devote substantial time to customers. As head of the new R&D group,
one leader in that company said he was “trying to get back to aspects of the early days
and be more agile and responsive” by working with customers on solutions for
innovation. He was also helping his group adopt a different mindset for R&D projects:
“If employees are not comfortable taking risks, or are afraid of failure, they’ll be quick to
dismiss new concepts as not achievable…. It’s just realizing that both methodologies
have their place.”
The leaders frequently described agility using terms and concepts of entrepreneurship. One leader set the stage by saying that like most small businesses, “We wear many hats; titles don’t mean much.” Another leader explained that employees were hired, not just for their skills, but also for their resourcefulness, new ideas, and the ability “to move a something forward.” Employees were told the “duty of an entrepreneurial company” is everyone pointing out any area not working, even beyond their own responsibilities. “Thinking like an owner of a startup” was an area on their performance evaluations. To spread entrepreneurial thinking, a third leader devoted significant efforts to “breaking open new mindsets so new possibilities are recognized” and supported them with process enhancements and leadership toolsets. First and foremost, agility was seen in the thinking of the people.

Agility also extended to leadership. One leader admitted a turnaround in his own mindset, “I no longer subscribe to the Soviet-Harvard model of planning” (i.e., detailed multi-year projections where missed commitments resulted in excess talent and space). With his more recent entrepreneurial experience, he switched to making decisions at “the last responsible minute” to maximize flexibility and avoid adding resources without real need. Another leader related their unusual approach to a project run off track; they would “flip the problem.” Instead of throwing resources at the problem, they would “take people out of it… and give the people some space to innovate,” thereby avoiding “intellectual entropy.” They had found better performance in small teams.

Agility as part of a dynamic capability was enabled by senior leadership’s values and trust. For instance, one founder leader described his leadership style as “open, communicative, ask any question, no hierarchy in the company.” In fact, “openness” was
one of the company’s seven values (seen stenciled on the walls, and printed on the sofa pillows in the headquarters foyer). The company’s website, in the values section, explained its “openness” value:

We believe our communication must be direct, honest, tactful and timely.

If we have something to say, we say it. If someone has something to share, we listen. Openness is integral to working together and to maintaining a culture that fosters and appreciates new ideas and fresh perspectives.

This leader strived to make sure everyone had ownership of where the company was headed and actively stressed that each was a critical piece of the puzzle. He emphasized “teamwork,” another company value supporting agility.

Agility did not always flow easily but sometimes called for diligence. One leader shared his greatest frustration was resistance and he devoted great effort to developing communications to employees while considering “the way they see the world.” He saw the notion of one person responsible for innovation decisions as “anathema to the biggest problem I face here which is adoption. The key is to get as many people involved as possible so it becomes their innovation.” He saw buy-in and alignment as critical to moving the company forward.

Trust emerged as connected to agility. A strong example was one company where the mutual trust among the co-founder triad was reflected throughout the organization. “Folks know that we are only as strong as our willingness to help each other.” Different departments frequently jumped in to figure out ways to solve a problem. One person would raise a hand and other groups would try to help because, as the leader explained, “It feels culturally right.” The employees in this young, thriving company had clarity of
purpose in being responsive. The leader summarized, “We’re fairly lean and small… an overwhelming amount of work… but we’re in the same boat… if we don’t get it done, the customers are unhappy and … the whole happy ecosystem doesn’t continue.” The agility of the startup days remained high.

Three leaders were watchful for the enemies of agility. One leader felt he had to combat managers “tending to value empire-building as more important than innovation and new ways of thinking.” Another leader put a priority on preventing walls, silos, or “becoming bureaucratic:”

I know it’s my responsibility to ensure that folks understand this is how we run here; this is how we operate; and we’re not in silos. And I have some stories for them to have them understand what happens when silos occur in a company. It’s when a company starts to die.

In the third company, leadership established internal systems to get ideas and complaints known and resolved quickly to prevent fiefdoms and ensure true information flows. Cross-functional issues were raised to the top.

Three companies described internal capabilities supporting agility. One leader cited a culturally enabled capability, “The biggest asset that we have is everybody in the organization is extremely comfortable with that rapid, iterative approach…. It’s radical by definition; you do not know how it concludes.” As a result, he was comfortable facing into any potential software challenge. Another company relied on its master process to provide uniformity for consistency, learning, scalability, and transferability. It was also instrumental in enabling integration of acquisitions and new processes thereby supporting growth without “splintering of the process.” The third company used its quarterly one-on-
one employee meetings for feedback which had led to ideas for a “whole shift in mentality, not only our team but also for the customers.” A reconfiguration in this business area offered the potential to expand capabilities for growth and future differentiation.

In effort to maintain agility and to prepare for pivots, leaders were vigilant in keeping abreast of technology and creating environments of innovation. One leader focused his effort on understanding industry dynamics and exploring those technologies related to the company’s foundation of reliability and competitiveness. Another leader applied his continually-updated knowledge to creating models and strategic building blocks to keep the company advancing. A third leader was constantly learning from the market space, creating dialog to generate new ideas, and espousing and furthering innovation in his company which he believed inspired the company to innovate. A fourth leader shifted from being the source of ideas to facilitating idea generation by helping the team “percolate them” and then bringing them to light for consideration. His intention was to foster an environment where everybody noticed opportunities for ideas and acted. These leaders were highly engaged in continual learning in their ever-expanding industries and in building cultures conducive to learning and discovery as a basis for their agility and ability to pivot.

Most companies were in the midst of seizing new opportunities; several were pursuing complete reconfigurations. Mentions of “shifts” and “pivots” portrayed the intensity of flux underway. For instance, one company was transforming from a systems house (project-orientation) to primarily a service-subscription company (products wrapped around services). Emerging technologies were ready and viable for a Cloud-
solution paradigm. New services would afford product expansions and entry into new markets. The intention was to “ignite the market as a service” and change the ground rules by solving urgent problems of smaller customers first. The leader was faced with managing the present and jumping into the future simultaneously. He explained an ambitious approach for a small company, “We launched… the concept of let’s sustain that systems business because that’s our bread and butter but at the same time do double work and create a products business.” Core business would fund the new product development. Agility would be critical.

Another major pivot was seen in a company reconfiguring its core product by reorganizing the department and changing the customer experience. In the midst of the change, the company won its largest contract so needed to deliver the work product while in flux. The leader described and explained the experience, “It’s like pushing a huge boulder up a hill….. Making it unstable was a conscious decision. So we could build to the next level, we had to be flexible and nimble to support higher demand and complexity.” A third leader spoke of “a double shift in our strategy” that required creating new capabilities: “We are revamping the employee side of the house, hiring different skills, paying more. It’s consistent with our path, but it’s a ‘full pivot.’” In a fourth company, a leader spoke of his experience leading a business transformation while simultaneously delivering current services saying it was a huge balancing act, like having a foot in two worlds and “one was moving pretty fast.” Each leader was wholly committed to the approach and displayed great agility themselves while helping their people and, as the last leader stated, “making sure no one was or felt left out.”
Other leaders were also addressing various talent implications of shifts and pivots. Efforts described were widely disparate among the leaders. All, however, seemed committed to mutual success across the organization. Two leaders in one company were discovering some people are more proactive and able to lead change and innovation than others. They were responding by expanding positions of those who seemed to flourish, reassigning those who did not, and providing coaching broadly. In another company, a new vice president of human resources was supporting efforts to create an environment that develops innovative and creative leadership. The changing marketplace and technology meant a shift in technical skill mix. The CEO utilized the vision to unify efforts and asked people to get excited about what the technology could do for customers and to look at the frontier for what capabilities are needed to empower customers with more powerful tools. He believed fundamental to success was, “Creating an environment where guys believe they can be innovative… they know they have the right; they don’t stop there.”

Maintaining agility and a readiness to pivot as necessary were necessary and challenging capabilities to foster. Some companies were taking the jump into a full pivot. As one leader reflected after transforming to a new business model, priorities shifted and the senior leadership team began to think more critically about what was next, “We all probably grew up and learned new skills in the process.” The components of dynamic capabilities were in full exposure – sense, seize and reconfigure.

**Theme 7: Tapping environmental munificence starting local and growing to transcend borders.** There was clear evidence of leaders tapping into environmental munificence available in the region in each company. The most commonly mentioned
regional support was the local incubator: High Tech of Rochester (HTR) and The Ben Craig Center (now part of Ventureprise) in Charlotte. Outside of this asset, mentions of strengths and frustrations were mixed, mostly positive.

In Rochester, two companies had utilized HTR’s resources (e.g., incubator office space and support, the LaunchPad program) with beneficial results. The third Rochester company had connected with the Technology Transfer Office at the University of Rochester (U of R) for access to research ideas for its startup (i.e., key scientists had become co-founders and later others had joined staff on part-time basis). Leaders in two companies noted the well-trained talent from the local colleges, especially with the co-op program at Rochester Institute of Technology. One company hired talent trained with medical, clinical and laboratory skills from U of R’s Medical Center. Access to new ideas and thinking was strong through the networks of CEOs and entrepreneurs. One leader planned to investigate a recently announced economic development zone and consider locating its R&D capability there to partner with universities. Another company had grown its multi-faceted interactions with a variety of academic communities where it had strong affiliations, in Rochester and beyond, which led to breakthrough ideas.

One leader lamented that too much regional attention was paid to startups given that most would fail or leave the area, and that meaningful job growth would come from the medium-sized companies. Another frustration was most conversations with local universities about collaborative studies prematurely turned to money. That leader had turned to powerhouse schools on both coasts for joint studies. Another leader indicated frustrations with a need for certain technical skills and the challenge of keeping talent in the area.
Two leaders cited advantages in starting a technology-oriented company in Rochester rather than in Silicon Valley. One advantage was “the good ideas in the universities were not picked over by a long line of VCs” (venture capital firms). Another was the talent was affordable and did not “jump ship” at the first sign of trouble. Affordability and continuity of people permitted more experimentation that led to more information and better outcomes. Further, employees had not been “spoiled” by huge VC budgets and were ingenious in devising clever approaches to experimentation.

In Charlotte, three of the four companies got their start in the Ben Craig center and credited the incubator’s support as key to their surviving the early years. One founder gave a comprehensive account of how the Ben Craig Center had contributed and guided them including structure, a prestigious address, access to a nice conference room for making a good impression assistance with hiring and raising capital, and colleagues with the other companies there.

Founders acknowledged a range of supports such as accounting classes and legal support geared to entrepreneurs. Specific groups were highly valuable, including Mecklenburg Entrepreneurial Council, Young Entrepreneurial Organization, Business Innovation and Growth Council and the local chapter of Entrepreneurs’ Organization. Experiences raising capital were mixed. One founder had local ties to the finance community to draw upon while another relied on contacts from his legal and accounting providers and eventually from the initial venture firm. In contrast, a third founder had more difficulty gaining funds for growth despite her early track record of profitable revenues. Still, this leader stated, “Charlotte is a business-friendly place as long as you
know where to look…and have the mentality.” Two companies took advance of tax incentives, one in its startup stage and the other in its growth stage.

Frustrations were largely around finding good people with the needed skills and fit with a startup culture. One leader commented that technical talent had increased since the early days and others had managed by working with professors to identify the best students and providing specialized training. On the balance, all leaders thought Charlotte was a good pro-business community.

**Summary of Research Question 2.** These seven themes were a synthesis of responses that flowed from questions on the interview guide. Four questions were direct prompts and two were exercises followed by opportunities to reflect. Participant leaders covered aspects of senior leadership residing in the individual, the senior leadership team, and the organization. The themes are not independent but interconnected and mutually reinforcing. The themes supported the responses and explained the dynamics.

Looking at analyses in Research Question 1 and Research Question 2, initial linkages were found between aspects of ambidexterity (based upon theory and research) and themes of the interviews (based on participants’ practice). While not a perfect match with the six aspects of ambidexterity, the seven themes were congruent and easily mapped into most aspects. The theme relating to environmental munificence was prompted directly by an interview question. Interest was sparked by the Two Dimensions of Organizational Ambidexterity model which had environmental munificence as a moderating variable (Cao, et. al, 2009, Appendix B). Responses showed it to be highly relevant to companies’ successes and to have medium relevance to the need for support going forward. Overall, aspects and themes are strongly linked (see Table 4.27).
Table 4.27

Comparison of Aspects of Ambidexterity (from Theories) and Themes (from Interviews/Practice)

<table>
<thead>
<tr>
<th>Aspects of Ambidexterity (Theory)</th>
<th>Themes of Interviews (Practice)</th>
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<tbody>
<tr>
<td>• Agility to create dynamic capability.</td>
<td>• Agility and pivots as part of dynamic capability.</td>
</tr>
<tr>
<td>• Deliberate efforts to exploit capabilities for today and to explore opportunities for the future (Duality/Balance)</td>
<td>• SME’s senior leadership team as the nexus (core and connectors).</td>
</tr>
<tr>
<td>• Tension Held at the Top</td>
<td></td>
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<tr>
<td>• Alignment and a culture that tolerates the paradox.</td>
<td>• Intense customer focus that abides through the growing pains.</td>
</tr>
<tr>
<td>• Exploration experimentation/rigorous learning.</td>
<td>• Relentless learning and experimentation.</td>
</tr>
<tr>
<td>• Custom organization models to support the duality.</td>
<td>• Efforts to provide, protect, and nurture resources for exploring an uncertain horizon.</td>
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<tr>
<td></td>
<td>• Emerging organizing mechanisms in SMEs in growth phase.</td>
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<tr>
<td></td>
<td>• Tapping environmental munificence starting local and growing to transcend borders.</td>
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The next section will describe the mixing analyses for addressing research question three. A summary will conclude the chapter.

**Mixed Methods Analysis**

**Research Question 3: How do the innovation orientations of SME leaders motivate innovation and its implementation as measured by the Innovation Strengths and Preferences Indicator®?** Following the guidance of Creswell and Plano Clark (2011), the mixed methods interpretation involved “looking across the quantitative results and the qualitative findings and making an assessment of how the information addresses the mixed methods question in a study” (p. 212). In addition to interpretations drawn from the qualitative and quantitative strands called “inferences,” this mixed methods analysis formed “meta-inferences,” interpretations made from across the qualitative and quantitative strands (Creswell and Plano Clark, 2011). These meta-inferences answered research question three and enriched the overall findings.

Insights into the senior leader experience had been enhanced through the ISPI™ results. These results had provided a useful data set throughout the research study:

- Preparing for the one-on-one interviews,
- Identifying where to probe during the interviews,
- Creating the interview summaries for the leader participants to review,
- Analyzing the data to identify areas of congruence and incongruence and to make meta-inferences.

In exploring ambidextrous leadership, the ISPI™ results provided perspectives of senior leaders as individuals and permitted exploration of how those leaders entered teams and led organizations.
Answering Research Question 3 encompassed reviewing the interview summaries, the ISPI™ comparisons (Appendix K), and the previous quantitative and qualitative sections of this chapter. The Data Analysis Spiral (Figure 4.9) provided a schema for approaching the three research questions. To explore deeper insights from the results, efforts were to link analytical pieces of the research to answer Research Question 3 using a mixed method approach.

![The Data Analysis Spiral](image)

*Figure 4.9. The Data Analysis Spiral (Creswell, 2007).*

A visual representation supported greater interpretation. A metaphor of a prism provided a schema for deeper understanding. Given the senior leader experience was central to the research study, the leaders served as the prism through which interpretation was illuminated (seeFigure 4.10). This analytical prism was not perfect and the intention
was not to pass ideas through undistorted to consolidate findings. It was translucent and
the sides were rough. The intention was to bend, scatter, and converge the findings in
order to capture the effect of the senior leader experiences in the synthesis of the mixed
method analysis. Three meta-inferences emerged to answer how their innovation
orientations motivated the leaders in this study:

1. SME leaders maintained a realistic self-awareness and created a collaborative
team to lead the organization along its innovation trajectory.

2. SME leaders put a priority on learning through efforts including
experimentation and action/reflection.

3. SME leaders experienced an ongoing interplay between working within their
preference orientations and harnessing their volition to do what was necessary
as the company moved from survival to growth to take off.

Figure 4.10. A Prism Schema as a Visual Representation of Analytical Process.

Quantitative and Qualitative Analyses

- Analysis of Leader Pairs (ISPI™)
- Evidence of Ambidexterity (vs. Theory → 6 Aspects)
- 7 Interview Themes (Practice)

3 Meta-Inferences

- Realistic self awareness and collaborative team.
- Priority on learning, experimentation and action/reflection.
- Ongoing interplay between preferences and volition.
The meta-inferences describe the senior-leader experience related to leading innovation and its implementation. These experiences were highly influenced by the leaders’ preferences and values as well as their visions and strategies. Each meta-inferences is described below.

**Meta-inference 1: Self-awareness and a collaborative innovation team.** Analysis of the ISPI™ results showed missing orientations and blind spots in every case. The leader pairs typically smoothed the gaps and mitigated the blind spots. Responses from one-on-one interviews revealed that leaders were usually aware of their strengths and deliberate in surrounding themselves with other leaders who would complement them. Because there were many strong leaders (majority were founders/co-founders) and leader pairs, there were variations on the theme of self-awareness and team creation. Four examples follow.

One company had a co-founder triad. Both leaders interviewed were Pinngers and especially high on risk. Each spoke to the importance of all three co-founders and was highly aware of their own and the others’ preferences. One saw himself as in the middle of the other two, who were “too different on radical innovation,” playing a moderating role (utilizing his strengths in Process where he was Extreme Builder). He described the triad as three pillars who together bring something “truly innovative” as well as “conceptually practical” and possible to deliver. On occasion, the third co-founder had countered the others’ risk preference (P/XP) with alarm, as if “the wheels were about to come off.” His view was the combination was “so rich in talent” and their success was because they were “closely knitted together.”
In another company, the CEO agreed with the ISPI™ results of a Bridger. He was most comfortable ("jazzed") in expansionary projects. He credited the CTO (not interviewed) as someone who was “out there.” After a month-long imagination trip, the CTO would return with a bounty of ideas, “half would be useless,” but it was necessary. The CEO (Midrange Pioneer on Ideation and Risk, next to the line with Pioneer) valued the CTO’s strengths, admitting the revolutionary end of the Innovation Continuum™ was “too risky.” The two had a “lovely relationship” and were in constant contention on ideas (e.g., necessary vs. far-fetched vs. go on instincts). The CEO said the evolutionary end of the Innovation Continuum™ was too boring, “Frankly, I get in the way”, (consistent with Pioneer in Process) and valued the Builder orientation of the VP Operations. Both the CEO and VP had Risk preferences on the Pioneering side and had “Action” orientations; there was a clear void in a “Prudent” orientation. The Director of Product Strategy was described as, “a much more practical innovator who seeks to improve current stuff…also helps to ‘decode’ theoretical ideas…into what is real and can be accomplished to help the customer gain value.” The CEO had located this person between himself and the VP Operations on the Innovation Continuum™. With the four key leaders identified and lined up on the continuum, the orientations had expanded and become more complementary.

At the time of the research, a third company was transforming its business model and expanding its leadership team. The CEO (Pingger and Extreme Pioneer in Process) had great clarity that he was the company visionary, systems creator, and paradigm breaker. He was absolutely not the builder, “I don’t implement anything.” Once he had suggested a way to “revolutionize the problem into something that’s new,” he handed it
to a “great team that finally understands my madness.” Similarly, the VP of R&D was strong on the Pioneer side (Pingger and Bridger in Process). Both preferred to “Diverge” (thinking and generating options). Balancing the two innovation leaders was the COO, who was more of a Bridger and Builder and brought to fruition. Further, efforts were underway to hire a new CEO (with the current founder CEO shifting to more customer focus, as Chair). The new CEO would have different, but complementary, preferences to implement the new business model and take the company to the next level of revenue growth. The senior team would be fuller and collaboration was expected to be very high.

In a fourth company, the CEO (a Pingger, “Conceptualizer,” and “Architect”) created an executive team which was the source of most of the innovations. The team was balanced with three Pioneers (CEO, President, and EVP Strategy) and five Builders (in delivery, marketing, and finance). Over the life of the company, he had led development of a Master Process to support improvements of current capabilities as well as adsorption of new capabilities.

Each of the CEOs in the previous four examples had orientations for Control – I Initiate/Others Initiate of “Yes/Yes.” This combination, known as “Our way,” fit the approach of creating a team and leveraging their differences. The second participants (e.g., the VPs and COOs) had a mix of Control preferences (only two with “Yes/Yes”). The CEOs set the tone and created the team to share the innovation charge.

*Meta-inference 2: Priority on learning, experimentation, and reflection* Most SME leaders emphasized learning, often as more important than the outcome of an experiment itself. A propensity to take a risk, try, and learn was consistent with the
ISPI™ orientations. The leaders’ orientations in Risk were Pioneer (2 Extreme Pioneers, 8 Pioneers and 2 Midrange Pioneers).

There were several clear examples with the leaders who were Pioneers in Risk (10). Most of these leaders (8) had a Passion orientation of “Action” and the others (2) were “Depends.” All ten spoke with enthusiasm about trying and learning (frequently using terms of experimentation when discussing products and services). Many related that they did not see themselves as risk takers but instead were constantly learning from being near or on the edge (consistent with a Pioneer in Risk). Once the decision was made, most acted quickly and accepted that mistakes were part of the learning process (consistent with orientation of “Action”). Examples of these perspectives included:

- “Get some ideas, happy to press on and experiment.” “Iterate and learn.”
- “To me, the biggest risk is not living up to your potential and you just don’t know…until you kind of fall off that cliff a few times or get really close and see what happens…[These experiences are the] way to a growth mindset.”
- “I’m okay taking risks…having people reboot. I expect that things will fail, especially when you’re taking risks. If it’s something where they didn’t consider other people or…jobs at stake…that’s where…[it] is difficult.”
- “Risk isn’t a bad thing…especially when it comes to innovation of new products, you want to push the boundaries. If you’re not failing, you’re not trying had enough.”

Other cases, although more subtle, were of Midrange Pioneers in Risk with Passion Orientations of Depends. In these cases the co-founders had sensed a market need and moved into successive market spaces opportunistically, and grown their
companies rapidly and successfully. Each one had seen their actions as innovative upon reflection. They continued to take chances with incomplete information, trusting their own judgments and their teams.

**Meta-inference 3: Interplay between preferences and volition.** In the startup years, the leaders related, they “wore many hats” and “did whatever it took” to survive. In the cases of co-founders, they divided the work to fit the obvious talents, such as one person playing the technical role and the other the business role. Necessity dictated the work to be done. Volition trumped preference. Later when feasible, several leaders shifted their work to fit their preferences and delegated aspects with poor fits. In several cases, when the leaders described their later roles, there was more congruence with their ISPI™ profiles. For instance, one CEO had been steeped in the details of running the young business (finance and operations) for many years despite that sustained detailed efforts were counter to his Pioneer orientations. In the recent years, he had delegated most operations aspects and put his energies into strategy, client workshops, and opening minds of the employees to embrace innovation. As a result, his efforts shifted to be in greater congruence with his ISPI™ profile.

Sometimes the growth meant scaling operations and pulling a Pioneer leader away from the creative side to take on duties preferred by Builders. That was the case for one leader who had missed the startup years while he used his project management skills (Process orientation of Midrange Pioneer). With a recent assignment to a new R&D group, he was delighted to return to a job that would once again emphasize his agility, creativity, and action (better fitting his Pingger profile).
Other times, a leader’s volition began to tire. One co-founder was a good choice for COO when the work was allocated at the start. Given his people orientations (Relationship of “Yes/Yes”, Networking of “Flex/Yes,” and Energy of “People”) coupled with his Process orientation of Midrange Pioneer, it made sense to give him responsibility for operations and 80% of the employees. Attending to the multitude of details of the COO position was counter to his preferences (a Pingger with Process orientation of Midrange Pioneer) and took much volition. He compensated by focusing on the people interactions which he enjoyed greatly. Initially, the position had required creating new things, but currently his energies were mostly on people. Some incongruence was evident given his preference for new ideas, “When left to my own devices, I get more excited about ideas.” This partial incongruence in role definition presented an opportunity to consider shifting the mix of operational (exploit) projects and discovery (explore) work.

In another company, the leaders where shifting with the challenges and opportunities of growing an entrepreneurial company. The CEO found the ISPI™ assignment to be challenging to take, since as entrepreneurs, we “don’t necessarily work in our preferred environment…deal with what you have.” She described a pulling between the comfortable and the required. There was another pulling related to innovation, “I’m comfortable having crazy ideas but…it has to serve a purpose…make sense for the business.” This tension was consistent with her orientations (Midrange Builder in Ideation and Process, and Pioneer in Risk). The other leader, a serial entrepreneur, described his role transitions. He first entered the company by investing to become a co-owner and later began to work as COO. Initially, necessity and vision drove him to lead projects to automate and scale for growth. With increased momentum and
greater cash flow, this COO shifted to work within his orientation, taking advantage of what he saw as the company’s unique capabilities. As a Pioneer on Risk, he would “find a way around” an existing system (tempered by responsibility “for the livelihood of all the folks”). As a Midrange Pioneer on Process, he translated his ideas for the team to execute while fostering shared purpose and alignment. At the time of the interview, the company was reconfiguring one department and creating a new business model. The roles of the leaders were shifting once again.

**Summary of Mixed Methods Analysis and Research Question 3.** The mixed analysis enhanced the previous quantitative and qualitative analyses. In areas of strong convergence, synthesizing the data from two sources provided a fuller interpretation. Three meta-inferences answered how innovation orientations of SME leaders motivate innovation and its implementation as measured by the ISPI™:

1. SME leaders maintained a realistic self-awareness and created a collaborative team to lead the organization along its innovation trajectory.
2. SME leaders put a priority on learning through efforts including experimentation and action/reflection.
3. SME leaders experienced an ongoing interplay between working within their preference orientations and harnessing their volition to do what was necessary as the company moved from survival to growth to take off.

These meta-inferences served as a foundation to the senior leader experience as prevailing traits relating to leading innovation and its implementation. These traits were highly influenced by the leaders’ preferences, values, and vision.
Summary of Results

The purpose of this research study was to inquire as to the presence of ambidextrous leadership in SMEs, and to identify how SME senior leaders succeed in the growth stage while advancing innovation. Further it was to investigate how, given their individual innovation orientations, SME leaders balance the seemingly conflicting leadership roles of innovation for today’s business and for future renewal. This chapter presented the results of the study with the one-on-one interviews serving as the primary data set and the ISPI™ orientations serving as the secondary data set.

Based on the interviews, evidence of ambidextrous leadership is clearly present in SMEs, but in an emerging form as measured against six aspects of ambidexterity that were drawn from the research literature for purposes of this study:

1. Senior leadership establishes and maintains deliberate efforts to exploit current capabilities for today and to explore opportunities for the future. Evidence of managing the duality would include a balance of projects along the Innovation Continuum™, a balance of time among efforts in existing (continuous improvement), new products and/or markets (product/market development efforts), and new/new (diversification), and processes and policies to support the duality.

2. Alignment and a culture that tolerates the paradox. Evidence would include a common strategic intent, an overarching set of values, a common vision, and descriptions of managing a dual environment.

3. Tension held at the top. Evidence would include the senior team making strategic tradeoffs and reconfiguring assets to support the duality.
4. Agility to create dynamic capability. Evidence would include senior-level efforts with the intention of creating agility throughout total organization, shifts to accommodate the duality and manage the duality, and pivots in response to opportunities and threats.

5. Custom organization models to support the duality. Evidence would include organizational approaches, such as separate efforts with mechanisms to leverage shared assets.

6. Exploration experimentation for rigorous learning. Evidence would include efforts to reduce uncertainty by narrowing assumptions.

Ambidextrous leadership was seen in the forms of the leaders themselves, the leadership teams, and the organizations. Aspects of “agility” and “tension held at the top,” appeared to be strongest. The aspect of “a custom business model” was less strong and emerging as ad hoc teams and organization trials.

Senior leaders of SMEs, in seeking to advance an organization on its innovation trajectory, utilize a variety of approaches to ensure the capabilities both for exploiting current innovation and continuously exploring future innovation. The seven themes revealed through the qualitative analysis were:

1. SME’s senior leadership team as the nexus (core and connectors).
2. Intense customer focus that abides through the growing pains.
3. Emerging organizing mechanisms in SMEs in growth phase.
4. Relentless learning and experimentation.
5. Efforts to provide, protect, and nurture resources for exploring an uncertain horizon.
6. Agility and pivots as part of dynamic capability.

7. Tapping environmental munificence starting local and growing to transcend borders.

The analysis of the mixed design revealed key meta-inferences to answer research question three. The primary data set (qualitative) resulted from the one-on-one interviews. The secondary data set (quantitative) was the ISPI™ analysis covering the fourteen SME leaders as individual leaders and as seven leader pairs. A prism served as a visual representation, the top ring of the data analysis spiral (Creswell, 2007), to provide guidance in the mixed method analysis. Three meta-inferences emerged, enhancing the findings:

1. SME leaders maintained a realistic self-awareness and created a collaborative team to lead the organization along its innovation trajectory.

2. SME leaders put a priority on learning through efforts including experimentation and action/reflection.

3. SME leaders experienced an ongoing interplay between working within their preference orientations and harnessing their volition to do what was necessary as the company moved from survival to growth to take off.

The next chapter presents a discussion of the findings. Limitations are provided. Areas for potential application and future research are also suggested.
Chapter 5: Discussion

Introduction

This chapter discusses the findings of the research study on innovation implementation and ambidextrous leadership in small and medium enterprises (SMEs). The purpose of the study was three-fold. The first part was to inquire as to the presence of ambidextrous leadership in SMEs. The second was to identify how these senior leaders, having survived the startup stage, succeed in the growth stage, while advancing innovation. The third was to investigate how the senior leaders balance the seemingly conflicting leadership roles of innovation for today’s business and for future renewal, given their individual innovation orientations. To those ends, the study sought to answer three research questions:

1. Based on interviews, is there evidence of ambidextrous leadership in small and medium enterprises (SMEs)?
2. In seeking to advance an organization on its innovation trajectory, how do senior leaders of SMEs ensure the capabilities both for exploiting current innovation and continuously exploring future innovations?
3. How do the innovation orientations of SME leaders motivate innovation and its implementation as measured by the Innovation Strengths Preference Indicator® (ISPI™)?

The design utilized a concurrent embedded mixed method. The primary method was qualitative with one-on-one interviews. The secondary, or “embedded,” method was quantitative and used the ISPI™. Efforts to answer the first two research questions were guided by content analyses: directed (deductive) for the first and conventional (inductive)
for the second. The effort to explore the third question was supported by a mixed methods approach utilizing data from the quantitative analysis of ISPI™ reports and the qualitative analysis of one-on-one interviews.

The research questions were answered and the three-fold purpose of the study was fulfilled. Evidence for the presence of ambidextrous leadership in SMEs was clear and compelling but in an emergent form. Rather than fully meeting criteria constructed from research of large and established organizations, these smaller and younger companies were creating forms conducive to growth given their particular strengths, needs, and contexts. Senior leaders, for the most part, were attending to the duality of exploiting today’s capabilities to meet customer needs and profit expectations and also exploring future horizons. They were engaging a variety of approaches that fell into seven themes, some inherent to their recent heritage as startups and others through deliberate efforts to advance their organizations along innovation trajectories. The ISPI™ results informed the one-on-one interviews and enriched the overall analyses. Meta-inferences emerged, including:

- Leaders’ self-awareness and efforts with their collaborative teams.
- An ongoing interplay between leaders working within their preferences.
- Harnessing their volition to do what was necessary; and high priorities on learning, experimentation, and reflection.

The research study was significant in providing a useful response to the challenges associated with sustained innovation and renewal in successful but relatively young SMEs, a segment frequently overlooked. The SMEs in the study were located in two medium-large metropolitan areas; both were facing renewal challenges. To varying
degrees, the SMEs had benefitted from their regions’ environmental munificence to reinforce and extend their capabilities. The prospect of the SMEs growing into enduring organizations was vital for their employees and communities.

This chapter has four sections. The next section looks at the implications of the findings with discussion and conclusions and then potential applications. The following section presents limitations of the research. The third section provides recommendations. The fourth, and final, section summarizes the study and its conclusions.

Implications of Findings

Analyses using a concurrent embedded mixed methods design. The quantitative was the secondary method and was embedded within the qualitative method. Each method produced a database and the two were compared as part of the mixed approach.

Quantitative findings. Review of the findings began with the quantitative to explain the participant leaders personally, first as individuals and then as leader pairs within each company. The ISPI™ provided a lens into the leaders’ preferences in innovating and working with others on innovation. For instance, half of the leaders had innovation orientations of Pioneer (or Extreme Pioneer) with strong preferences for radical innovations but possibly less comfort with implementation. The other half had orientations of Bridgers (six as Midrange Pioneers and one as a Midrange Builder) indicating greater comfort with implementing innovation and creating ideas that would be incremental or expansionary but probably not radical. The orientations of how leaders preferred to work with others showed an even wider variation of strengths and gaps.
Comparing the profiles of each leader pair generated the most meaningful insights. Moving from analysis of individuals to leader pairs offered more potential in explaining ambidextrous leadership working with projects spanning the Innovation Continuum™. Some pairs were strong by reinforcing and extending one another as well as providing ease of mutual understanding and efficiencies in decision making. Other pairs were strong through their different but complementary orientations which created balance, and thereby covered a larger range of the Innovation Continuum™, and strengthened implementation capabilities. Each leader pair had missing orientations, some potentially creating blind spots. Certain differences could generate misunderstanding or conflict. Ensuring mutual understanding and enhancing the orientations surrounding the leader pairs could fortify the pathways to sustained innovation. “Leveraging Differences” is a key human principle of innovation (Rosenfeld & Kolstoe, 2006) and a pillar (part of “the essence”) of the Innovation House, a multi-level model for sustained innovation (Rosenfeld & Wilhelmi, 2011).

Further investigation of the ISPI™ results afforded insights into the entrepreneurial orientations of the leaders. Given the criteria built into the algorithms of the ISPI™ for assigning expected roles, less than half of the leaders were indicated as “Entrepreneurs” (43% for evolutionary and expansionary projects and 36% for revolutionary projects). These percentages of role assignments presented a discontinuity given that nine of the fourteen leaders (64%) had been initial founders and two had later become partial owners (i.e., through investment or merger) for a total of eleven (79%). The analysis went deeper and accessed reports and data made available by the ISPI™ owners, Innovation Connection Systems (ICS). For example, looking at those with
orientations noted as “problematic” for an Entrepreneur role, instances of “No” in Networking were neutralized by the presence of the other leader who had “Yes” or “Flex” (in six of the seven companies). This possibility of collaborating and compensating afforded opportunities for playing the role of Entrepreneur as a team rather than only as a single individual and provided partial, but important, explanation of the companies’ growth and continued success. Leveraging differences for sustained innovation was seen as beginning within the senior leader team.

**Qualitative findings for research questions 1 and 2.** To address the first research question, the qualitative method employed directed content analysis. To create criteria for evaluation, leading ambidexterity theories and definitions were synthesized and reduced into six aspects to indicate the presence of ambidexterity:

1. Senior leadership establishes and maintains deliberate efforts to exploit current capabilities for today and to explore opportunities for the future (Duality/Balance).
2. Alignment and a culture that tolerates the paradox.
3. Tension held at the top.
4. Agility to create dynamic capability.
5. Custom organization models to support the duality.

Responses from each leader pair were combined to form input encompassing the individual leader, the leadership team, and the organization.

Clear and compelling evidence of ambidextrous leadership in SMEs was identified. Two companies had strong evidence in five of the six aspects and one
company had strong evidence in four of the six. To understand the overall presence of ambidexterity in SMEs, each aspect was evaluated separately. Two aspects had strong evidence: “Tension Held at the Top (3)” and “Agility (4).” Three aspects had medium evidence: “Duality/Balance (1),” “Alignment (2),” and “Experiments/Rigorous Learning (6).” Evidence for the aspect of “Separate Efforts/Custom Model (5)” was the weakest by far, having three medium and four weak aspects in their evaluations. While ambidexterity was clearly present overall, it was emerging in a form distinct from what theory described in large established companies. The “Separate Efforts/Custom Model” requirement may be less relevant or may need modification to meet the needs of SMEs.

Addressing the second research question, conventional content analysis revealed seven themes of how leaders ensured the capabilities both for exploiting current innovation and continuously exploring future innovation. The seven themes (and representative responses) include:

1. SME’s senior leadership team as the nexus (core and connectors). “The pillar that each person brings.”
2. Intense customer focus that abides through the growing pains. “Journey mindset with the customer.”
3. Emerging organizing mechanisms in SMEs in growth phase. “Yin and yang.”
4. Relentless learning and experimentation. “Iterate and learn.”
5. Efforts to provide, protect, and nurture resources for exploring an uncertain horizon. “We set up a separate group with the impetus to innovate and move forward.”
6. Agility and pivots as part of dynamic capability. “Making it unstable was a conscious decision. So we could build to the next level, we had to be flexible and nimble to support higher demand and complexity.”

7. Tapping environmental munificence starting local and growing to transcend borders. “Charlotte is a business-friendly place as long as you know where to look...and have the mentality.”

While not a perfect match with the six aspects of ambidexterity, the seven themes were congruent and easily mapped into most aspects. The theme relating to environmental munificence was prompted by an interview question. The interest was based upon a model that had environmental munificence as a moderating variable (Cao, et. al, 2009). The responses to this question showed it to be a highly relevant theme related to the companies’ successes to date and have medium relevance to their need for further support going forward. The aspects and themes are shown side by side in Table 4.20)

**Mixed method findings for research question 3.** Results of the ISPI™ provided helpful input to prepare for the one-on-one interviews and to uncover clues for where to probe further. The mixed method approach incorporated analyses of two data sets (i.e., ISPI™ results for quantitative, one-on-one interviews for qualitative) and provided insights instructive to the personal experiences of the leaders themselves as they guided their organizations. The analyses yielded “meta-inferences” drawn from interpretations made across the qualitative and quantitative strands (Creswell and Plano Clark, 2011).

Data analysis had reached the top ring of Creswell’s Spiral (2007) with a visual representation. A prism schema aided the analysis process and supported forming meta-
inferences. Regarding how the senior leaders’ innovation orientations motivated innovation and its implementation, three meta-inferences informed the research:

1. SME leaders maintained a realistic self-awareness and created a collaborative team to lead the organization along its innovation trajectory.
2. SME leaders put a priority on learning through various efforts including experimentation and action/reflection.
3. SME leaders experienced an ongoing interplay between working within their preference orientations and harnessing their volition to do what was necessary as the company moved from survival to growth to take off.

These analyses generated fact-based descriptions of the leaders as a group and explanations of the dynamics they created in terms of the drivers and modifiers of their behaviors. As a group, these leaders were curious intellectually. In action as they entered new frontiers, they were adventurous and enterprising. They were responsible in protecting the welfare of those they served.

**Discussion of implications and conclusions.** The findings of this study were largely interdependent and mutually reinforcing. They coalesced around several interesting areas; three were selected for focused discussions. First, ambidextrous leadership was emerging and taking forms distinct from large established organizations. Second, the senior leadership team served as the nexus for ambidexterity. Finally, and most promising, was the notion of ambidexterity as a vehicle to transform the agility inherent to SMEs into dynamic capability.

_Ambidextrous leadership in SMEs was emerging and taking forms distinct from large established organizations._ Tushman & O’Reilly (1997) envisioned an
“ambidextrous organization” where managers “play two different games simultaneously” (p. 3): the efficiency game for today using traditional management tools and a revolutionary game for tomorrow requiring new skills and dynamics. In companies with strong or entrenched core businesses, radical innovations would be served best in a separate organization where they can be legitimized and protected. The issue in determining where to locate revolutionary efforts was how to empower them to increase their chances for survival and success. Indeed, in several SMEs in the study, leaders were pursuing “a new design that enables a dual purpose for the organization; to exploit an existing business and to simultaneously explore a related new business” (Govindarajan & Trimble, 2005, p. 47). Separate organizations or business units were few. Resources were extremely limited; yet, the SMEs had the asset of agility to bring to bear in finding the right design for their context.

In contrast to ambidexterity efforts in large companies, separate business units for breakthrough projects were rarely evident in the SMEs of this study. Further, there were no pre-determined explore-to exploit ratios for projects. Nor was there a single leader driving a strategic initiative labeled “ambidexterity.” Rather with these SME leaders, ambidextrous leadership was the presence of clear and deliberate efforts to create environments and capabilities to support innovation efforts for both today and a future horizon. Leaders acknowledged the challenges of thriving (“in this happy ecosystem” as depicted by one leader) while living in the paradox of ambidexterity. Many had initiated organizational changes (e.g., R&D groups, a separate business unit to avoid the “vortex” of current operations) and process enhancements to deal with the competing forces. They were learning from these trials and reconfiguring talent and processes to improve. All the
while, the leaders held tensions at the top and kept ever vigilant of the need for breaking silos at first sight.

To sustain innovation, efforts must be deliberate and the approach repeatable (O’Reilly & Tushman, 2008). The leaders were making deliberate efforts both to explore and exploit. Most leaders in the study supported projects across the Innovation Continuum™. Further, most were devoting efforts to existing product/market spaces as well as to new products/market spaces (i.e., all four quadrants of Ansoff’s Product-Market Matrix). A balance between projects to exploit and projects to explore was found to be linked to firm performance for smaller companies, commonly resource constrained (Cao, et.al, 2009). In this study, the distribution of projects and devotion of senior leader time was more balanced than expected. When combining these evaluations with other interview responses, the companies as a group showed “Medium” evidence overall (4 were strong, 2 medium, and 1 weak) for the ambidexterity aspect of Duality/Balance. Efforts to create approaches to ensure repeatability were evident in internal processes and especially in the priorities on experimentation and learning.

Leaders communicated to the employees what constituted an important contribution to the business. They provided clear and consistent messages about the need to take care of today’s obligations and also to innovate for the future. They were fact depending upon the company’s cultural and organizational agility to live in this paradox.

Managing ambidexterity implies resourcing the exploration efforts. In fact, “slack capacity” (i.e., spare resources) was found to be one of the proven conditions for sustained innovation (along with shared understanding; organization-wide alignment; tools and training; diversity; and interaction mechanisms) in a study by Birkinshaw,
Understanding slack capacity was uncommon in these SMEs. Leaders spoke of future-oriented projects relying on ad hoc groups. For instance, “tiger teams” was mentioned (a term typically referring to programmers volunteering for projects such as finding security holes or software errors). Another approach was projects on the side with people using “magic time” (i.e., time “found” for interesting work, beyond formally-approved duties with “allocated time”). These efforts, driven by passionate and interested people, had led to successes but may not be a reliable system for maintaining an intended balance. Resources assigned to exploring breakthrough projects may need to be dedicated for a given time period and given protection from unplanned work so they are not, in the words of one leader, “pulled into the vortex” of daily operations. While experimentation was celebrated in most companies, those dedicating the majority of their time to exploration may need senior leadership’s support to legitimize their future-oriented work (i.e., beyond the current customer or immediate profit horizon) and ensure they do not feel isolated from the mission-critical vibe of the young company.

**Senior leadership team served as the nexus for ambidexterity.** As is true for an organization’s ability to innovate successfully, responsibility for ambidextrous leadership sits squarely on the shoulders of senior leadership (the “C-suite”). Based on their research, Tushman, Smith, and Binns (2011) found “that firms thrive when senior teams embrace the tension between old and new and foster a state of creative conflict at the top” (p. 76). Rather than letting resource conflicts fall to the front lines, the senior team must orchestrate management of the inconsistencies and make the associated strategic trade-offs. The senior team would establish “team processes capable of managing these
inconsistent alignments in a consistent fashion” (O’Reilly & Tushman, 2008, p. 193).

Most SMEs in this study were within range of this desired state of ambidexterity.

Given the shorter life and fewer management layers, holding tensions at the top was expected in the study and was seen as the norm overall for the SMEs. One leader portrayed the dynamic as a “constant tug of war” between customer care and remaining relevant in the future. Common elements were trust and contention. Specific efforts and processes to manage the paradox took varied forms, most of them were evolving. In another company, there was a “yin and yang” dynamic between the three-year roadmap and the next release. To grow capabilities for both exploiting existing and exploring new innovation, leaders instituted two types of regular meetings with distinct audiences and time horizons (“top down” to keep in the forefront and “middle up” for improvements and scale). In another company, the leader devoted senior team meetings to open discussions about direction, priorities, and what to stop doing. A third company has built capabilities to get ideas and issues known rapidly, pre-empt fiefdom building, and ensure flows of pure information to senior leaders. Systems were forming to evaluate ideas after early piloting to gain approval for the project pipeline. Senior teams were engaging in definite efforts to orchestrate the inconsistencies and support a duality.

The leaders’ self-awareness and the collaborative nature of their teams enabled ambidextrous leadership. The leaders spoke of the senior team’s composition, describing the members’ innate strengths more than their positions or expertise. As well as recognition, several leaders leveraged the differences of its members through role allocation and in the rhythms for collaboration and creativity. As shown by the analyses of the ISPI™ reports, each leader pair covered a wider range of the Innovation
Continuum™ jointly than individually. In the interviews, several leaders gave specific examples of how the make-up of their teams provided the right mix for innovation types, from implemental to breakthrough, and for innovation implementation. Trust had been central. The leaders followed the sage wisdom of Kouzes and Posner (2007), “At the heart of collaboration is trust….The more trusted people feel, the better they will innovate” (p. 225) Trust had been maintained among co-founders and extended to others brought into the senior teams.

Leveraging the differences with respect and trust was evident. For instance, a CEO and CTO had a “lovely relationship” with strong trust and constant contention on ideas. These leaders were replicating creative contention within their innovation groups. One VP had formed a forward-looking team of service architects who were “extremely different” in personalities, outlooks, and views of technology. He asked them to challenge each other, professionally and with courtesy, to generate the best ideas. It was working; the CEO of this company had praised these service architects, “they get it!” Leveraging differences, a pillar of sustained innovation, appeared to be a strength of the SMEs.

Ambidextrous leadership extends beyond any one individual, including the CEO. In the Harvard Business School article entitled The Ambidextrous CEO (Tushman, Smith, & Binns, 2011), CEOs were blamed for ceding the balance of needs between core business and innovation efforts to core-business heads who failed to provide adequate support to innovation. The CEO challenge was to retain responsibilities and tension in the “C-Suite.” Beyond that mandate, the authors shifted their focus to the senior leadership team. This research study revealed the senior leader team as the nexus in a theme of the
qualitative analysis and was supported by the results of the quantitative analysis. The ISPI™ results demonstrated that leaders’ preferences regarding innovation and its implementation vary and no one leader had preferences spanning the full Innovation Continuum™. Combining leaders into pairs showed broader coverage but there were still missing orientations. The interviews named other key members of the senior team who would balance and fill voids. By working together and leveraging differences, the senior leaders complement, compensate, and create synergies. These combinations are especially helpful for small companies possibly lacking in leadership depth. Another reason for the senior team as the nexus of ambidexterity is the necessity for consensus on ambidexterity’s strategic importance and the many the trade-offs to be made. Further, ambidexterity as a senior team capability provides smoother transitions for succession of key leaders. The CEO role, therefore, would be to set the tone for ambidexterity. A proposition for ambidexterity is “a common vision and values that provide for a common identity” (O’Reilly & Tushman, 2008). This proposition would fall to the CEO’s leadership and is consistent with the time-tested leadership principles of “modeling the way” as described by Kouzes and Posner (2007): clarifying values, affirming shared ideals and aligning actions with shared values (p. 26).

In this research study, ambidextrous leadership was centered in the senior leader team. The CEOs set the tone and supported the dual agendas. The senior teams, leveraging their individual differences, made critical strategic decisions on direction and resources. Recognizing distinctions in the duality, the teams created linkages and processes. As teams, the leaders were making clear efforts to attend to the aspects and inconsistencies of ambidexterity.
Ambidexterity as a vehicle to transform the agility inherent to SMEs into dynamic capability. “Agility and pivots as part of dynamic capability” was a strong theme emerging from the analysis. This important quality coupled with the theme of “relentless learning and experimentation” could serve as a foundation for dynamic capability, particularly given the unpredictable and rapidly changing conditions facing these companies. O’Reilly and Tushman’s (2008) definition clarifies the relevance: “Ambidexterity is a specific capability embodied in senior leadership’s learning and expressed through their ability to reconfigure existing organizational assets and competencies in a repeatable way to adapt to changing circumstances” (p.200). They linked ambidexterity to the three components of dynamic capability (i.e., sensing, seizing, and reconfiguring). They charged senior leaders to expand in these areas, specifically:

- Sensing through promotion of learning to learn, supporting new approaches and associated failures, and integrating knowledge transfer;
- Seizing opportunities through strategic vision and action;
- Reconfiguring to “reallocate resources away from mature and declining businesses toward emerging growth opportunities” (p. 191).

Leadership needs the conscious ability “to orchestrate assets and resources in a repeatable way” (p. 201). The SME’s presence of agility and learning were necessary but not sufficient qualities for dynamic capability, the needed element was repeatability. The potential, however, was promising. SME leaders were creating and nurturing many of the elements that could enable such a transformation.

Most SME leaders were intentional about making innovation repeatable, drawing on competencies and culture. Still holding onto their startup roots, efforts to maintain
entrepreneurial thinking and culture were evident. For instance, they were asking employees to “think like a leader of a startup” and look beyond the boundaries of their jobs for improvement opportunities. Prospective employees were interviewed for entrepreneurial attributes as much as for technical skills. One leader with a new R&D group intended to return to the agility of “the early days” and spend much more time with customers.

In the SMEs, components of dynamic capability were present. Mutually supporting themes from the interviews were “agility,” “intense customer-focus,” and “relentless learning and experimentation,” all key to sensing. Frequently mentioned in interviews were “shifts” and “pivots” to order to seize new opportunities and adjust to changing conditions. Typically, these moves meant reconfigurations (e.g., talent, resources, and customer interfaces). These qualities and the associated dynamics were enabled by company cultures, such as one company that clearly and consistently lived its values of openness and teamwork. That CEO had a leadership style that was “open, ask any question, no hierarchy in the company.” That leadership and the company’s culture underpinned the agility that served them well in making opportunistic pivots and shifts.

Through the companies’ innovation histories, approaches to seizing opportunities crossed a broad spectrum. Some were based on sensing an opportunity (e.g., meeting a latent market need with new technology). Others were radical ideas that started as problem solving (e.g., a “pebble-in-your-shoe” issue). More recent were those following new practices using a lean methodology (i.e., quick experimentation with customer feedback loops before entering R&D). Many were strategic innovations (i.e., different customers, customer needs, or process of creating value). Although the approaches
varied, a common trait among the leaders was a general comfort with going against convention and considering new paradigms. With ISPI™ risk orientations skewing to the Pioneer side (9 Pioneers/Extreme Pioneers and the rest in the Midrange as Bridgers), this was a group willing to pursue a new horizon. This comfort with the distinct dynamics of radical innovation was relevant when the leaders, unified as senior teams, “reallocated resources…toward emerging growth opportunities” (O’Reilly & Tushman, 2008, p. 191).

In deciding to seize a new and uncertain opportunity, the leaders used various methods to, in the words of one leader, “place bets and move forward.” They spent considerable time in discussions with other senior leaders to form the best decision and increase consensus, thereby reducing the risk that radical initiatives would falter for lack of support.

Further, senior leaders adopted mindsets and methods conducive to dynamic capability. Beyond passion for learning and celebration of experiments, failures as well as successes, there were a bevy of instrumental attitudes. One was to “flip the problem” and give people space to innovate by pulling resources off when a project hit trouble. Another was the flexibility “to make a decision at the last responsible minute” rather than trying to meet expectations of a rigid, multi-year plan. A leader explained an approach of reducing strategies to “smaller bets.” He saw this flexibility as key, “The unique competitive advantage of startups is it’s easier for them to do what feels right.” These attitudes coupled with agility and supported by culture permitted greater risk taking with fewer resources and, thereby, enabled reconfigurations.

These analyses assumed that all leaders held a vision for their companies to become enduring organizations. The study sought companies in the stage called “Success-Growth” with the goal of growth into the stage of “Take-off” (Churchill &
Most leaders appeared committed to a future with long-term horizons. Granted, some company leaders may someday disengage or shift intentions to being acquired. For those that choose to forge an independent path, ambidexterity as a vehicle to dynamic capability could light the way. The SMEs were on solid footing. The leaders were leading change and the companies were adapting. Commitment to mutual success was clearly strong. Senior teams were evolving along with their companies. As one leader reflected, “We all probably grew up and learned new skills in the process.” The components of dynamic capabilities were in full exposure – sense, seize and reconfigure.

**Practical Application**

These findings as related to the theory submit that senior leaders must be intentional in their efforts to create capabilities for both current and future innovation. These efforts should be deliberate and made explicitly. Because of especially scarce resources (talent and financial), SME leaders must be watchful of the balance dimension between efforts to exploit and explore (Cao, et.al, 2009). The Innovation Continuum™ provides explanations of projects ranging from evolutionary to revolutionary and a means to match leadership talent and build development teams to support them.

**Significance of Study**

Research in innovation implementation has grown with the surge of interest in innovation. Ambidexterity has been raised as a means of both exploiting current capabilities for today’s needs while exploring potential capabilities for the future. Recent interest in research and practice expanded to small and medium enterprises (SMEs). SMEs, left in the shadows until now, had been upstaged by the interest in saving the large
companies from the creative destruction that Schumpeter made famous last century and also by the intense interest on startup companies as a source of ideas.

Many senior leaders were seeking specifics on how to implement efforts for sustained innovations success. This study looked closely at how a collection of SME senior leaders, in seeking to move their organizations along its innovation trajectory, It considered the individual strengths and preferences of the senior leaders as motivations for implementation. The study used the ISPI™, an instrument that was well proven but mainly with people working in large organizations. As the central instrument in this study, it revealed evidence and insights about the ISPI™’s relevance to people working in SMEs.

The study’s findings served to adapt research from one setting to this vital community of businesses. It showed the relevance of ambidexterity to SMEs and the location of ambidextrous leadership with the senior team. By linking key themes of SME leadership with the components of dynamic capability, the findings and discussion described a pathway to becoming enduring organizations able to withstand the rapidly changing dynamics of their industries.

Limitations

Possible limitations existed in the areas of participants, data collection, and data analysis. These limitations were deemed minor to the overall findings of the study. They are described below.

Because the fourteen leaders were selected as a convenience sample, bias may have been present. Further, the Delphi experts suggested leaders who would likely be open to conversations in the research area. One participant (Participant 1 of Company
Charlotte A), introduced by a Delphi expert, was Co-founder and President but not the CEO. The second participant was highly involved with implementing innovations in that company. The Co-founder and CEO was not available but might have provided a distinct and rich contribution to the insights of the study.

In the area of data collection, sorting the project cards into innovation types (i.e., evolutionary, expansionary, or revolutionary) was subjective. Although each was provided consistent definitions, the participant’s judgment was through a personal lens. Particularly with revolutionary projects, the sorting may have been affected by the participant’s individual innovation orientation and estimation of the project’s potential impact on the company’s business model or the industry as a whole. Additionally, participants were aware of the purpose of the study and its interest in ambidexterity. There may have been a tendency to allocate some number of the projects to each project type or some portion of their time to each quadrant of Ansoff’s Product-Market matrix.

Regarding data analysis, the ISPI™ instrument measures many preferences across cognitive, affective, and conative orientations but does not measure volition. Volition, an element of conative, can be used to override preferences, such as when individuals decide to live within their values, act upon their intentions, or comply with external mandates. In this study, analysis of volition was possible in the qualitative portion but did not afford the opportunity for mixed methods.

**Recommendations**

**Practice.** One recommendation is for senior leaders seeking to advance innovation (i.e., move the organization along its innovation trajectory). Typically, a strategic planning effort would evaluate strengths, weaknesses, threats, and opportunities
(SWOT analysis), preferably incorporating the company culture and employees’ competencies. One opportunity for applying the findings of this study would be to first conduct an analysis of the senior team in terms of individual strengths in innovation. The analysis would identify the gaps as related to individuals’ outlooks, perspectives, and preferences (i.e., fit) and then, develop a plan to fill those gaps. Introducing a tool such as the ISPI™ into the dynamic of plan creation would afford rigor and objectivity. Later, similar evaluations can be made in creating development teams to fit the type of innovation project.

Another recommendation to support ambidextrous leadership would be to strengthen efforts to provide, protect, and nurture efforts for exploring innovation. Resources would be fully dedicated (some for short-term assignments and others for longer-term) to avoid continual interruptions and afford fully entering the distinct world of exploration. Those dedicating the majority of their time to exploration may need senior leadership’s support to legitimize their future-oriented work (i.e., beyond the current customer or immediate profit horizon) and ensure they do not feel isolated from the mission-critical vibe of the young company.

**Education.** Leaders of graduate schools of business may find SME executive participants would benefit from incorporating insights and findings of this study into their course experiences. Examples follow of opportunities to adapt or expand current programs for illustrative purposes. A version of an executive education course at Harvard Business School (HBS), *Leading Change and Organizational Renewal* (led by Michael Tushman) could apply ambidexterity theory and best practices to the distinct concerns of SMEs. Ambidextrous leadership could be added to executive education programs at
several business schools focusing on entrepreneurial leadership (e.g., HBS, Babson College) and growing businesses (e.g., Stanford University and Kellogg School of Management at Northwestern University).

**Research.** Six areas with potential for future research are described below. The first would be case studies looking at entire senior leader teams as well as those involved with the full range of innovation efforts to gain a complete description of the dynamics. A fuller set of ISPI™ feedback would add to telling the whole story.

Another investigation, possibly as part of case studies, would be of a theory called “contextual ambidexterity” as it relates to SMEs. “Contextual ambidexterity” may be informative by seeing it as “emerging through a company’s organizational context as well as through its structure” (Birkinshaw & Gibson, 2004, p.48). Insights from this theory may further inform this study’s findings related to SMEs in the aspects of ambidexterity.

A third area would be to look at the effects on SME product developers in juggling both current projects (exploiting) and breakthrough projects (exploring). Areas of investigation would be the aspects of culture, employee motivation, and organizational systems of recognition and reward. This research might compare those insights against the company’s effectiveness of producing radical innovation on schedule.

A fourth area would be a longitudinal study to follow the development of ambidexterity as companies pass through the growth stages. Observations would note changes in leadership approaches to moving companies along the innovation trajectories. Particular focus could be on when efforts to introduce ambidexterity enter leaders’ agenda, in what forms, and the associated challenges and degrees of success.
A fifth area would be investigating ambidexterity as a means of implementing innovation in SMEs not oriented to technology, with slower dynamics and lower risk of disruption. In these settings, ambidexterity may be less relevant. Alternatively, ambidexterity may assume a pattern of exploration followed by exploitation, each by different groups and in sequence rather than simultaneously. A sequential pattern may follow descriptions in March’s early work on ambidexterity (1991).

A sixth, and final area, would be environmental munificence for companies in the stage of “Success-Growth” and poised for the next stage of “Take-off” (Churchill & Lewis, 1997). This research study showed clear positive support for the early stage, particularly from incubators and helpful venture capitalists. As companies in their growth stage, participants mentioned helpful supports to be availability of well-trained talent and opportunities to network with each other, but little more. In fact, one leader of a medium company lamented that inordinate attention was being paid to the startups. That attention would yield greater returns given that startups often fail or move away, and especially since the medium companies would generate many more jobs. Regions would be well advised to amplify their efforts with successful SMEs seeking to grow. While Rochester and Charlotte are not the “innovation clusters” of Boston or Charlotte, more must be done. “Research shows that social interactions among creative workers tend to generate learning opportunities that enhance innovation and productivity” (Moretti, 2013, p.138). Companies and their employees seek a flow and diffusion of knowledge. Medium large cities, such as those in the study, must figure out how to support these needs and identify additional latent needs for action. Further study is required.
Summary and Conclusions

Innovation has gained “top billing” in business strategy and corporate communications for organizations large and small. While large businesses are seeking “renewal” and “change,” small businesses focus on growth and continued relevancy. Innovation is difficult and uncertain. Failure rates are excessively high, often due to issues of implementation. These failures are more than opportunities lost to the organization; they represent scarce resources wasted on both financial and human capital fronts. Small and medium enterprises (SMEs) that have survived startup (“Success-Growth” Stage, as defined by Churchill & Lewis, 1983) face the double challenge of gaining scale and efficiencies and remaining relevant in a rapidly changing marketplace.

SMEs are highly significant to local and national economies and the flow of innovation. In 2006, one-half of the U.S. private sector consisted of small businesses. Across the country, the most promising growth rates are coming from the medium enterprises (e.g., gross domestic product and jobs). Yet until recently, there was a void in research on the challenges of leading successful innovation for companies who have success based upon their first set of great ideas.

Theories of ambidexterity had evolved to answer how leaders can exploit current capabilities for today and explore new capabilities for future viability. A myriad of distinctions between the exploit and explore modes and how to manage the duality raised many questions for leadership. Many questions were addressed by research over the past two decades, but only recently has the research shifted to SMEs. This research study seeks to contribute to the areas of innovation implementation and ambidextrous leadership in SMEs.
The research domain of this study consists of fourteen leaders, in seven technology-oriented SMEs. Having survived the startup years, these leaders are leading innovation efforts to pursue growth in rapidly-changing industries. The companies are located in two medium-large metropolitan areas, Rochester, NY and Charlotte, NC, both facing renewal challenges.

The purpose of the study was three-fold. The first part was to inquire as to the presence of ambidextrous leadership in SMEs. The second was to identify how these senior leaders, having survived the startup stage, succeed in the growth stage, while advancing innovation. The third was to investigate how the senior leaders balance the seemingly conflicting leadership roles of innovation for today’s business and for future renewal, given their individual innovation orientations. A concurrent embedded mixed method research design assisted the investigation by answering the three research questions:

1. Based on interviews, is there evidence of ambidextrous leadership in small and medium enterprises (SMEs)?

2. In seeking to advance an organization on its innovation trajectory, how do senior leaders of SMEs ensure the capabilities both for exploiting current innovation and continuously exploring future innovations?

3. How do the innovation orientations of SME leaders motivate innovation and its implementation as measured by the Innovation Strengths Preference Indicator® (ISPI™)?

The design generated two databases. The primary method was qualitative analyses of one-on-one interviews. The secondary method was quantitative analyses of
ISPI™ reports. This mixed method design afforded enhanced richness of data, greater completeness of and increased credibility.

The research questions were answered and the three-fold purpose of the study was fulfilled. Evidence for the presence of ambidextrous leadership in SMEs was clear and compelling but in an emergent form. To view evidence of ambidextrous leadership in SMEs, the lens is through the aspects of ambidexterity as derived from the research literature (primarily Tushman & O’Reilly, 1997, O’Reilly & Tushman, 2008, and Govindarajan & Trimble, 2011). Six aspects of ambidexterity include:

1. Senior leadership establishes and maintains deliberate efforts to exploit current capabilities for today and to explore opportunities for the future (Duality/Balance).
2. Alignment and a culture that tolerates the paradox.
3. Tension held at the top.
4. Agility to create dynamic capability.
5. Custom organization models to support the duality.

Evidence is strong in at least two of the aspects of ambidexterity for each company, but no company shows strong evidence in all aspects. Two companies have five aspects with strong evidence (neither has evidence strong in “custom models”). The aspects of ambidexterity with the most consistent strong evidence are “tension held at the top” and “agility.” In “Duality/Balance,” awareness of the ambidexterity dilemma is clearly present across all companies. Evidence for “exploration experimentation for rigorous learning” is strong in four companies. “Customer models” was the weakest area
of all aspects. While there were some custom models, efforts to separate the efforts fully are usually viewed as unnecessary or infeasible. Rather than fully meeting criteria constructed from research of large and established organizations, these smaller and younger companies are creating forms conducive to growth given their particular strengths, needs, and contexts.

The senior leaders have full focus on advancing their companies along an innovation trajectory. They work diligently and deliberately to ensure the capabilities both for exploiting current innovation while continuously exploring future innovations. They engage in numerous approaches that cluster into seven themes:

1. SME’s senior leadership team as the nexus (core and connectors).
2. Intense customer focus that abides through the growing pains.
3. Emerging organizing mechanisms in SMEs in growth phase.
4. Relentless learning and experimentation.
5. Efforts to provide, protect, and nurture resources for exploring an uncertain horizon.
6. Agility and pivots as part of dynamic capability.
7. Tapping environmental munificence starting local and growing to transcend borders.

While not a perfect match with the six aspects of ambidexterity, the seven themes are congruent and easily map into most aspects. The theme of environmental munificence was prompted by an interview question to explore a component of a model used in the research. It enhances understanding the context of these seven companies located in the two regions.
The mixed method analysis of the two databases (ISPI™ results and one-on-one interviews), reveals three meta-inferences: Three meta-inferences emerged to answer how the innovation orientations motivated the leaders in this study:

1. SME leaders maintained a realistic self-awareness and created a collaborative team to lead the organization along its innovation trajectory.

2. SME leaders put a priority on learning through efforts including experimentation and action/reflection.

3. SME leaders experienced an ongoing interplay between working within their preference orientations and harnessing their volition to do what was necessary as the company moved from survival to growth to take off.

As a group, these leaders are curious intellectually. In action and entering new frontiers, they are adventurous and enterprising. They feel responsible in protecting the welfare of those they serve.

Synthesizing these analyses, three areas of interest emerge for discussion. The first area is “ambidextrous leadership in SMEs is emerging and taking forms distinct from large established organizations.” The leaders were making deliberate efforts both to explore and exploit. The most obvious difference with large companies is SMEs’ custom models are seldom separate business units. SMEs lack of “slack capacity” makes separate units infeasible. Further, their high agility and relentless learning and experimentation may make them less necessary.

The second area is “the senior leadership team served as the nexus for ambidexterity.” Given their smaller size and fewer management layers, holding tensions at the top is the norm overall for the SMEs. Specific efforts and processes to manage the
paradox are evolving. The leaders’ self-awareness and the collaborative nature of their teams enable ambidextrous leadership. Trust and contention support “leveraging differences” (Rosenfeld & Wilhelmi, 2011). The CEO sets the tone and provides the vision. The senior teams make critical strategic decisions (resources and tradeoffs) and create the processes and linkages to support the duality. As teams, the leaders are making clear efforts to attend to the aspects and inconsistencies of ambidexterity.

The third area of interest is “ambidexterity as a vehicle to transform the agility inherent to SMEs into dynamic capability.” O’Reilly and Tushman (2008) showed ambidexterity as a viable means of achieving dynamic capability through “sensing,” “seizing,” and “reconfiguring.” SMEs in this study form a clear theme of “agility and pivots as part of dynamic capability.” This important quality coupled with the theme of “relentless learning and experimentation” could serve as a foundation for sensing, particularly given the unpredictable and rapidly changing conditions facing these companies. The needed piece is repeatability. Most SME leaders are serious about making innovation repeatable drawing on competencies and culture. With their “intense customer-focus”, the SMEs are able to sense critical changes in external conditions and technology. Their stories speak of numerous pivots and shifts to seize opportunities, all with associated reconfigurations. The components of dynamic capabilities are in full exposure – sense, seize and reconfigure. Ambidextrous leadership is the vehicle to make the transformation.

Recommendations are for SME senior leaders to be intentional in their efforts to create capabilities for both current and future innovations and to be watchful of the balance between exploiting and exploring efforts. In strategic planning, a
recommendation is to start by looking at the senior team using the ISPI™ as a rapid means to identify issues and blind spots in innovation and implementation. Later, similar evaluations can be made in creating development teams to fit the type of innovation project. Another recommendation is to recognize those projects warranting a fully-dedicated team. During these assignments, senior leadership can support the effort by protecting their time and nurturing the exploration. Final recommendations call for universities and regional groups to create high impact support to SME leaders. As they grow into enduring organizations, these SMEs offer tremendous potential and promise in contributing to their stakeholders and society overall.
References


Xerox highlights more than 100 years of history, investment and partnership in Rochester. (2008). *M2PressWIRE*.
## Appendix A

### Rochester, NY and Charlotte, NC

#### Measures of Comparison

<table>
<thead>
<tr>
<th>Measures</th>
<th>Greater Rochester, NY</th>
<th>Greater Charlotte, NC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population 2011 (MSA)</strong></td>
<td>1,055,278</td>
<td>1,795,492</td>
</tr>
<tr>
<td></td>
<td>#52 in USA</td>
<td>#34 in USA</td>
</tr>
<tr>
<td><strong>Small Business Vitality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ranking in US top 100</td>
<td>#21</td>
<td>#24</td>
</tr>
<tr>
<td>• Score</td>
<td>14.87</td>
<td>14.30</td>
</tr>
<tr>
<td>• # companies with 100 or fewer employees</td>
<td>22,849 small businesses</td>
<td>43,520 small businesses</td>
</tr>
<tr>
<td><strong>Innovation Index</strong></td>
<td>100.4</td>
<td>95.2</td>
</tr>
<tr>
<td>• Total index (U.S. is 100)</td>
<td>71.3</td>
<td>94.4</td>
</tr>
<tr>
<td>• State resources available</td>
<td>95.4</td>
<td>102.6</td>
</tr>
<tr>
<td>• Economic well-being from innovation activities</td>
<td>113.1</td>
<td>119.0</td>
</tr>
<tr>
<td>• Ability to innovate –</td>
<td>79.9</td>
<td>86.4</td>
</tr>
<tr>
<td>o human capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o economic dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In U.S.’s top 5</td>
<td>In top 15 Creative</td>
</tr>
<tr>
<td></td>
<td>innovation-intensive</td>
<td>Cities</td>
</tr>
<tr>
<td></td>
<td>metro areas</td>
<td></td>
</tr>
</tbody>
</table>

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*aRanking and population as of July 1, 2011, estimated by United State Census Bureau (accessed through Wikipedia.com on 8/20/2012). *bBusiness Journals On Numbers, annual ranking of best opportunities for small businesses to grow and prosper. Austin finished number one in 2010, 2011, and 2012 (with score of 46.88). Top 50 locations have positive scores and next 50 have negative scores. *cInnovation Index project conducted by Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University’s Kelley School of Business, and other research partners. Project is funded in part by the U.S. Commerce Department’s Economic Development Administration. *dThe New Republic’s analysis using data from the OECD on patent applications (2012). *eCreative Cities International Vitality Index in 2011 as reported in the Charlotte USA Economic Guide.*
Appendix B

(Cao, Gedajlovic, & Zhang, 2009)

Two Dimensions of Organizational Ambidexterity

Balance dimension of ambidexterity (BD)
[exploration – exploitation]

Combined dimension of ambidexterity (CD)
(exploration ∩ exploitation)

Organization size

Firm performance

Environmental munificence
Appendix C

Definition of Terms

Ambidexterity: The essence of ambidexterity is balancing the tensions between exploiting today’s capabilities to meet immediate survival and exploring future opportunities to ensure long-term viability. As related to dynamic capability, ambidexterity is “the specific capability embodied in senior leadership’s learning and expressed through their ability to reconfigure existing organizational assets and competencies in a repeatable way to adapt to changing circumstances” (O’Reilly & Tushman, 2008, p. 200).

Ambidextrous leadership: Senior leadership establishes and maintains deliberate efforts, typically separate, to exploit current capabilities for today and explore future opportunities for the future. Leadership holds the separate efforts together by “a common strategic intent, an overarching set of values, and targeted structural linking mechanisms to leverage shared assets. These internally inconsistent alignments and the associated strategic tradeoffs are orchestrated by a senior team with a common fate incentive system and team processes capable of managing these inconsistent alignments in a consistent fashion” (O’Reilly & Tushman, 2008, p. 193).

Creative destruction describes how radical innovation continually displaces old products and methods and thereby disrupts entire industries and propels economies forward. The entrepreneur is the agent of innovation (Schumpeter, 1934).

Environmental munificence: The extent, from abundance to scarcity, that external resources are available to support growth of an organization (e.g., technological
knowledge and industry information through external partnerships). (Dess & Beard, 1984; Keats & Hitt, 1988; Cao, Gedajlovic & Zhang, 2009)

**Exploitation:** “The essence of exploitation is the refinement and extension of existing competence, technologies, and paradigms. Its returns are positive, proximate, and predictable.” (March, 1991, p.85). Descriptors include refinement, choice, production, efficiency, selection, implementation, execution.

**Exploration:** “The essence of exploration is experimentation with new alternative. Its returns are uncertain, distant, and often negative” (March, 1991, p.85). Descriptors include search, variation, risk taking, experimentation, play, flexibility, discovery, innovation.

**Gandhian innovation** revolutionizes markets and harnesses technology to serve the unserved. Focus expanded to include people. (Prahalad & Mashelkar, 2010)

**Innovation:** “The effort to create purposeful, focused change in an enterprise’s economic or social potential” (Drucker, 1985, p. 67).

**Innovation Orientation (iO™):** Indication of where individual prefers or are predisposed to work along the full Innovation Continuum™. A person’s “sweet spot” for being innovative, composed of four unique “orientations.” (ICS material for ISPI™).

**Innovation Orientation Modifiers (iOM™):** Indicators showing how an individual “modifies” the approach developing innovative ideas – seek information, make decisions, find energy to generate ideas, work with others, and preferred action mode. Consists of eight unique “orientations” (ICS material for ISPI™).

**Innovation Strengths Preferences Indicator®:** An indicator that looks at twelve unique “Orientations” that affect how people approach innovation, drawing on research from all
three aspects of mental functioning – how people think (cognitive), take action (conative), and meet their personal relational needs (affective). (ICS for ISPI™ certification)

**Innovation trajectory:** “A path over time encompassing both historical realized innovation strategy and future intended strategy.” (Nemanich, Keller & Vera, 2007)

**Organizational ambidexterity:** Initially conceptualized by March (1976) as the need for an organization to have dual structures: one to focus on learning for current needs and profits and the other for learning new knowledge to ensure future vitality. Later extended by Tushman and O’Reilly (1997) beyond separate subunits to distinct business models for each, entailing different competencies, systems, incentives, processes and cultures—each internally aligned.

**Small and medium enterprise (SME):** Business organizations with annual revenues between $10 million and $1 billion and with employees numbering between 10 and 3,000.

**Strategic entrepreneurship:** Combination of “advantage seeking” with “opportunity seeking” in order to grow the organization and also improve society. The profit motive expands to include an equal focus on people. (Hitt, et al., 2011).

**Strategic innovation:** Innovation that departs from the established firm’s current business model (core business). Distinguished by significant difference in customers (“identification of potential customers”), customer needs (“conceptualization of customer value”), or the process of creating value (“value-chain design”). (Govindarajan & Trimble, 2010).
Appendix D

Innovation Continuum™
(Rosenfeld & Wilhelmi, 2011)
Appendix E

ISPTM: Ranges of How Like to Innovate (Permission Granted for Use)

1. **Overall Innovation Orientation (IO™)**

<table>
<thead>
<tr>
<th>Extreme Builder</th>
<th>Builder</th>
<th>Mid-Builder</th>
<th>Mid-Pioneer</th>
<th>Pioneer</th>
<th>Extreme Pioneer</th>
</tr>
</thead>
</table>

   **Builder** | **Pioneer**

2. **Ideation Orientation – your approach to the generation of new ideas**

<table>
<thead>
<tr>
<th>Extreme Builder</th>
<th>Builder</th>
<th>Mid-Builder</th>
<th>Mid-Pioneer</th>
<th>Pioneer</th>
<th>Extreme Pioneer</th>
</tr>
</thead>
</table>

   **Focused Ideation** | **Prolific Ideation**

3. **Risk Orientation – your approach to taking risks**

<table>
<thead>
<tr>
<th>Extreme Builder</th>
<th>Builder</th>
<th>Mid-Builder</th>
<th>Mid-Pioneer</th>
<th>Pioneer</th>
<th>Extreme Pioneer</th>
</tr>
</thead>
</table>

   **De-Risk the Situation** | **Risk Taker**

4. **Process Orientation – your approach to establishing and following process**

<table>
<thead>
<tr>
<th>Extreme Builder</th>
<th>Builder</th>
<th>Mid-Builder</th>
<th>Mid-Pioneer</th>
<th>Pioneer</th>
<th>Extreme Pioneer</th>
</tr>
</thead>
</table>

   **External Focused Processes** | **Internal Focused Processes**

---

**BUILDERS**

**MID-RANGE**

**PIONEERS**

**EVOLUTIONARY (Incremental)** → **EXPANSIONARY** → **REVOLUTIONARY (Breakthrough)**
Appendix F

**ISPI™ Totem**

Ranges of How Like to Innovate (iO) and Innovate with Others (iOM)

(Permission Received for Use)

<table>
<thead>
<tr>
<th>Total</th>
<th>XB</th>
<th>B</th>
<th>MB</th>
<th>MP</th>
<th>P</th>
<th>XP</th>
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<tbody>
<tr>
<td></td>
<td>I prefer to work on Incremental Changes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I prefer to work on Breakthrough Changes</td>
</tr>
<tr>
<td>Ideation</td>
<td>I prefer to make existing things “better”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I prefer to design new things and/or do things “differently”</td>
</tr>
<tr>
<td>Risk</td>
<td>I prefer to work within the system and minimize risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I prefer to challenge the system and take risks</td>
</tr>
<tr>
<td>Process</td>
<td>I prefer to work within established processes and am good at details</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I prefer to develop my own processes and work with details for short bursts of time only</td>
</tr>
</tbody>
</table>

**iO™**

<table>
<thead>
<tr>
<th>Control</th>
<th>No</th>
<th>Flex</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Initiate</td>
<td>I prefer to have no control over other people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others Initiate</td>
<td>I prefer to be in control of my own activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Relationship**

<table>
<thead>
<tr>
<th>I Initiate</th>
<th>No</th>
<th>Flex</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no interest in getting to know others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others Initiate</td>
<td>I want to be left alone</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Networking**

<table>
<thead>
<tr>
<th>I Initiate</th>
<th>No</th>
<th>Flex</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t need to include or invite others to be part of my activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others Initiate</td>
<td>I don’t really care if others invite or include me in their activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Input**

<table>
<thead>
<tr>
<th>Concrete</th>
<th>Flex</th>
<th>Visionary</th>
</tr>
</thead>
<tbody>
<tr>
<td>I begin by looking for the details and the facts</td>
<td></td>
<td>I begin by stepping back and looking at the big picture</td>
</tr>
</tbody>
</table>

**Flow**

<table>
<thead>
<tr>
<th>Converge</th>
<th>Flex</th>
<th>Diverge</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to focus on being effective and efficient</td>
<td></td>
<td>I prefer to play with many options and resist closure</td>
</tr>
</tbody>
</table>

**Passion**

<table>
<thead>
<tr>
<th>Prudent</th>
<th>Depends</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to be more prudent and am slower to take action</td>
<td></td>
<td>I prefer to take quick action and others may see me as impulsive at times</td>
</tr>
</tbody>
</table>

**Output**

<table>
<thead>
<tr>
<th>Head</th>
<th>Flex</th>
<th>Heart</th>
</tr>
</thead>
<tbody>
<tr>
<td>When making a decision, my first concern is the facts</td>
<td></td>
<td>When making a decision, my first concern is people</td>
</tr>
</tbody>
</table>

**Energy**

<table>
<thead>
<tr>
<th>Self</th>
<th>Flex</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to be alone to recharge and to process problems by myself</td>
<td></td>
<td>I prefer to be with others to recharge and when solving problems</td>
</tr>
</tbody>
</table>

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Appendix G

Profile Shared with Delphi Experts

Implementing Innovation with Ambidextrous Leadership in SMEs

Doctoral Dissertation – Field Research

Deborah L. Pearce

Purpose

1. Inquire as to the presence of ambidextrous leadership in small and medium enterprises (SMEs).
2. Identify how senior leaders of SMEs, having survived the startup stage, succeed in the growth stage, while advancing innovation.
3. Investigate how they balance the seemingly conflicting leadership roles of innovation for today’s business and for future renewal, given their individual innovation orientation.

Profile of Company Candidate

Proposal for discussion with experts in Delphi study

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
<td>Stage III – Success Growth (post survival &amp; existence/pre-mature)</td>
</tr>
<tr>
<td>Intention</td>
<td>Build successful enduring company</td>
</tr>
<tr>
<td>Age</td>
<td>Min. 5 years (5 – 10+ years)</td>
</tr>
<tr>
<td>Size: # Employees</td>
<td>50 -250</td>
</tr>
<tr>
<td>Profits</td>
<td>“Sustainably profitable”</td>
</tr>
<tr>
<td>Business</td>
<td>Technology-oriented</td>
</tr>
<tr>
<td>Location</td>
<td>Headquarters in Greater Rochester/Charlotte area (MSA)</td>
</tr>
</tbody>
</table>
Appendix H

Participant Companies – Request for Consideration

Implementing Innovation with Ambidextrous Leadership in Small and Medium Enterprises
Deborah L. Pearce
Candidate for Doctorate in Executive Leadership, St. John Fisher College

Candidate background: Deborah’s educational background includes a BS from University of Virginia’s School of Engineering and Applied Science and an MBA from Harvard. Her career has encompassed sales (AT&T, Data General and IBM), leadership/executive roles in product management, technology planning, innovation, and regional general management (GE and Otis Elevator) and consulting across a wide range of industries. Currently, Deborah is an executive consultant (CEO, LeaJames, Inc.) and serves on not-for-profit boards. She has successfully defended her research proposal and is ready to begin her field research for final defense this fall and graduation in December.

The research topic: How senior leaders advance the organization along its innovation trajectory in companies that are beyond startup and now pursuing successful growth. How do they ensure capabilities for both exploiting current innovation and continuously exploring future innovations? How do they motivate innovation and its implementation?

Rationale:

- The area of innovation implementation is critical:
  - The best ideas need to make it to the marketplace and succeed.
  - But the overall yield is low, meaning losses in resources (financial and physical) and human capital (hours and passion).
- Small and medium enterprises (SMEs) need to thrive beyond the startup phase and into successful growth with efforts for dual time horizons:
  - Exploiting and strengthening for current success.
  - Exploring the next innovation for future success.
- The senior leaders bring personal talents and passions to the expanding equation:
  - Leverage own strengths.
  - Leverage different talents.

Participants/elements of participation: CEO and key additional person involved with innovation (e.g., COO/CTO):

- One-on-one interviews (six questions, approx. one hour and fifteen minutes).
- Short, well-proven instrument (Innovation Strengths Preferences Indicator®) two weeks prior (approx. 15 minutes on-line). Results describe how participant
prefers to innovate across the Innovation Continuum™ and work with others when innovating.

- Brief phone call for clarification of interview/survey results (approx. 10 minutes).

**Benefits to the participants:**

- **ISPI™** results shared at interview (32-page booklet, link to online interpretation) for reflection and discussion with other participant. Useful when incorporated into working with others involved in innovation/exploration/implementation process. Usual $75 fee is covered by research grant.
- Insights from meeting summary sent within a few weeks and research summary sent after final defense.
Appendix I

Interview Guide

Participant Code:

Company Code: Location (circle one): Rochester area/Charlotte area

Tracking:

<table>
<thead>
<tr>
<th>Type of data gathering</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISPI</td>
<td></td>
</tr>
<tr>
<td>Interview</td>
<td></td>
</tr>
<tr>
<td>Phone follow-up</td>
<td></td>
</tr>
<tr>
<td>Interview summary</td>
<td></td>
</tr>
</tbody>
</table>

Note: For privacy, company and participant names will be given pseudonyms in the research report. Confidentiality will be ensured through coding and anonymizing.

Demographics:

- Education (level and area):
- Age:
- Position and longevity (in organization and in position):
- Innovation background (organizations and positions):

➤ (5 minutes, timer reads 5)

Interview questions:

Introduction question: Tell me about how you came to this company (or this company came to you) and your roles here since you’ve arrived.

1. Would you share more with me regarding your role in innovation here? Probe:
   a. How has it changed as the business moved into/through its growth?
   b. What efforts do YOU PERSONALLY make to keep the company moving along its innovation trajectory?
      - I am using Peter Drucker’s definition for innovation: “the effort to create purposeful, focused change in an enterprise’s economic or social potential.”
For innovation trajectory, I mean the path over time encompassing both historical realized innovation strategy and future intended strategy.

Think about the series of improvements and expansions to your products and services. Also think about would be considered breakthrough. This is sometimes called “strategic innovation” in that it departs from the current core business. Significant difference in customers, customer needs, or the process of creating value.

c. What efforts do others in senior leadership make?

➤ (10 minutes, timer reads 15)

2. To get started on looking more deeply, I have 10 index cards I’d like to give you. I will ask you to think about the major projects related to your products/services and note each one on a separate card. (Note: You might not have enough to fill in all the cards, that’s fine. If there are more than 10 projects, think about the largest). Don’t worry about the title of the projects; just capture them in your own words so you recognize them. To maintain confidentiality, feel free to use any code name, you’ll know what you mean Next, please sort them into short-term and long-term piles. (Note on the cards). Next sort them into routine/incremental vs. expansion vs. breakthrough/radical. (Note on the cards).

➤ (15 minutes, timer reads 30)

3. When you think about last month, how did you allocate your time among the projects? How much of your time is spent on:
   a. Continuous improvement projects for existing products?
   b. Projects seeking to expand your products or services?
   c. Identifying future needs that you may solve with new products and services?

It may help to think about projects using a matrix (present matrix on a card) (Note: based on work by Igor Ansoff in his book Corporate Strategy, 1965).

<table>
<thead>
<tr>
<th>Markets</th>
<th>Existing</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future needs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

➤ (10 minutes, timer reads 40)
4. In thinking about your efforts to achieve innovation, what have you found to work? What are your biggest frustrations? Probe:
   a. Root causes: Why did that work? Can you give me an example?
   b. In some companies, innovation decisions are mostly tackled by the senior leaders. And then operational decisions are made by middle management. How are they addressed in your company?
   c. Who has primary responsibility for making innovation decisions? Who has secondary responsibility? (Note: if the answer is “all of us”, probe further.)
   d. Every company has pulls and tugs about how to make resource decisions. How are those decisions made here? When there is conflict, how do “ties” get broken?

   ➢ (10 minutes, timer reads 50)

5. Thinking about growing your business in this region, versus being in Silicon Valley or the Nevada desert, what are the greatest supports that you can tap? What are the greatest challenges regarding resources?

   ➢ (10 minutes, timer reads 60)

6. Thank you for taking the ISPI™ indicator. Looking at the results, your profile indicates when you are creating ideas, your preferences would place you as a Pioneer/Bridger/Builder….. (as related to ideation, process, risk and overall). Share brief description prepared on a card. (Ask following questions and then present 32-page feedback report.)
   a. Does that seem to fit your orientation?
   b. Given the range of projects from continuous improvement to the next big project, how do you personally manage the differing demands of the projects related to current products vs. projects related to breakthrough/radical projects?
      ▪ For example, in some companies, priorities go to the squeaky wheel/fire-fighting. In others, resources and attention are dedicated to breakthrough projects regardless of what’s happening in the rest of the company. How do you manage the dynamics? Do you isolate and protect the innovation from the resource demands of day-to-day?
      ▪ What is your personal involvement? How does it differ depending on the type of innovation?

   ➢ (20 minutes, timer reads 80)
Review next steps:

- Follow-up phone call (in 1-2 weeks for 15 minutes):
  - Discuss your questions about the ISPI™.
  - Clarify my questions that emerge upon reflection and analysis.
- E-mail summary of discussions for review and comments (sent within 5 days of call).
- Brief summary of study results (later this year).

➤ *(10 minutes, timer reads 90)*

THANK YOU!
Appendix J

Permission to Use Ansoff’s Growth Vector Matrix (Product-Market Matrix)

Pearce, Deborah< dl04742@sjfc.edu>

Permission to use Ansoff Growth Vector Matrix
1 message

Peter Ansoff
Reply-To: To: DLP04742@sjfc.edu

Dear Deborah,

Hello! I received your letter yesterday. I'm not sure what happened with the message you left – we must have accidentally deleted it somehow, and I'm sorry about the delay that that caused. At any rate, you have permission to use the growth vector matrix as described in your letter of 18 March. I'll be glad to provide written confirmation if this email is not sufficient – just let me know.

Again, sorry for the delay! I hope that your defense goes well, and please let me know if there's anything else that you need. By the way, in case you haven't run across it, there is a decent Wikipedia page about my father. I don't know who wrote it, but it is a fair summary of his professional career. An interesting tidbit, which I don't think the article mentions, is that he was apparently the first person to use the term “synergy” in a business/management context.

Best regards,

Peter Ansoff
Annandale, Virginia
Trustee, Ansoff Family Trust

office

home
## Appendix K

### ISPI Analysis of Leadership Pairs - Rochester-A

<table>
<thead>
<tr>
<th>Innovation Orientation (iO)</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>μ/σ=3 Bars</th>
<th>Analysis and Potential Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pingers (Pioneer in Ideation &amp; Risk): Creates ideas prolifically, links insights across multiple planes, thinks outside the box, and challenges the status quo.</td>
<td>XP1: Prolific idea generator, with unique perspective.</td>
<td>XP1: Prolific idea generator, with unique perspective.</td>
<td>XP1/0.5 Bar</td>
<td>Similar: As Pingers, share comfort zone in creating abundance of rich ideas.</td>
</tr>
<tr>
<td>Total</td>
<td>PF1: Prefers working on new problems/ideas and breakthrough projects.</td>
<td>XP3: Unconventional, finds prescribed methods restrictive. Not concerned with consistency. Does not see own actions as risky.</td>
<td>XP2/1.5 Bars</td>
<td>Expanding: Into tail end of risk comfort. Missing orientation: Builder seeking to refine and de-risk eccentric ideas so more adaptable.</td>
</tr>
<tr>
<td>Visionary/Divergent - sense of innovation and risk</td>
<td>PF3: Unconventional, finds prescribed methods restrictive. Not concerned with consistency. Does not see own actions as risky, often unaware others see them as huge.</td>
<td>XP1: Strong bias on novelty. Potential blind spots: Implementation considerations and need to optimize and integrate into existing systems for continuity. Missing orientation: Builder and Bridger to ensure success and efficiency.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Innovation Orientation Modifiers (iOM)

<table>
<thead>
<tr>
<th>Affective: Control</th>
<th>Yes/Yes: &quot;Our way.&quot; Natural tendency to take control and head others. Open to outside guidance and review. Comfortable with others taking initiative.</th>
<th>Flex/Flex: &quot;It depends.&quot; Scans environment for cues before deciding how much to initiate or speak up.</th>
<th>Complementary: Synergy possible through the balance, particularly if EVP informs CEO of caes observed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective: Relationship</td>
<td>Yes (far right)/Yes (far right): &quot;Let’s get close.&quot; Initiates personal connections, engaging at levels of both head/intellect and heart/emotion. Creates bond to relate more effectively, allowing better understanding, and developing trust. Openness to others approaching depends on situation. Welcomes being approached by others, not an intrusion.</td>
<td>Flex/No (far right): Initiates adding to/without dismissing as random or outlier.)</td>
<td>Similar: Potential blind spot: Getting caught up in generating rich, abundant ideas rather than considering implementation/process building.</td>
</tr>
<tr>
<td>Cognitive: Input</td>
<td>Visionary: Initiative, common for Pingers.</td>
<td>Visionary: Initiative, common for Pingers.</td>
<td>Similar, Blind spot: Concrete (ability to sense input without dismissing as random or outlier.)</td>
</tr>
</tbody>
</table>

### Appendix K

250
### Appendix K (continued)

#### ISPI Analysis of Leadership Pairs - Rochester-B

<table>
<thead>
<tr>
<th>ROC-B</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>IO Total</th>
<th>Analysis and Potential Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pingers (Pioneer in Ideation &amp; Risk): Creates ideas prolifically, links insights across multiple planes, finds outside the box, and challenges the system.</td>
<td>Pingers (Pioneer in Ideation &amp; Risk): Creates ideas prolifically, links insights across multiple planes, finds outside the box, and challenges the system.</td>
<td>Pingers (Pioneer in Ideation &amp; Risk): Creates ideas prolifically, links insights across multiple planes, finds outside the box, and challenges the system.</td>
<td>Pingers (Pioneer in Ideation &amp; Risk): Creates ideas prolifically, links insights across multiple planes, finds outside the box, and challenges the system.</td>
<td>Similar: As Pingers, share comfort zone in creating abundance of rich ideas.</td>
</tr>
</tbody>
</table>

**Innovation Orientation (IO)**

- **Process:** XB1: 0.5 Bar

#### Innovation Orientation Modifiers (IOM)

<table>
<thead>
<tr>
<th>Affective:</th>
<th>Relationship:</th>
<th>Cognitive:</th>
<th>Creative:</th>
<th>Descriptive/Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/Yes: &quot;Our way:&quot; Natural tendency to take control and lead others. Open to outside guidance and review. Comfortable with others taking initiative.</td>
<td>Yes (far right)/Yes: &quot;Let's get close.&quot; Initiates personal connections, engaging at levels of both head/intellect and heart/emotion. Creates bond to relate more effectively, allowing better understanding, and developing trust. Openness to others approaching depends on situation.</td>
<td>Visionary: Begins with prime objective; a vision of possibilities serves greater purpose than details. Pingers tend to be visionary.</td>
<td>Action: Common for Pingers. Acts quickly once decision made. Accepts mistakes are part of learning process.</td>
<td>&quot;Creative Optimizer&quot; Pinger and Process Builder</td>
</tr>
<tr>
<td>Missing orientation:</td>
<td>Missing orientation:</td>
<td>Flex (next to line on Head): Able to base decisions on logic and/ or values (people) depending on situation. Interpreter/Bridge between business strategy and encouraging people</td>
<td>Heart (next to line on Flex): Common for Pingers. While creating idea/solution, holds consistent concern for how well can and will be utilized by others.</td>
<td>Mutually re-enforcing and complementary orientations: Two Pingers with one XB in Process, combination brings abundant ideas balanced by one’s desire to build a system. Differences support learning through testing. Pioneer orientation in Risk and strong shared Action in Passion mitigated by CEO's Extreme Builder orientation in Process.</td>
</tr>
</tbody>
</table>

**Appendix K (continued)**

---

*Notes:*
- ROC-B: Rochester-B
- IO: Innovation Orientation
- IOM: Innovation Orientation Modifiers
- Pingers: Pioneers in Ideation & Risk
- XB: Builder orientation in Process
- XP: Pioneer orientation in Process
- MP3: Builder orientation in Process
- ROC-B: Rochester-B
- "Creative Optimizer": Pinger and Process Builder

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*Source:* ISPI Analysis of Leadership Pairs - Rochester-B

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*Disclaimer:* The information provided is for educational and reference purposes only. Always consult with a professional for accurate and up-to-date advice.
## Appendix K (continued)

### ISPI Analysis of Leadership Pairs - Rochester-C

<table>
<thead>
<tr>
<th>ROC-C</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>g&gt;0.5 Bars</th>
<th>Analysis and Potential Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Pinggers</strong></td>
<td><strong>iOM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>P1: Prefers working on new problems/ideas and breakthrough projects.</td>
<td>P2: Prefers working on new problems/ideas and breakthrough projects.</td>
<td>P3/0.5 Bar</td>
<td>Similar: Pinggers, share comfort zone in creating abundance of rich ideas.</td>
</tr>
<tr>
<td></td>
<td>P2: Prolific idea creator with unique perspective.</td>
<td>P1: Prolific idea creator with unique perspective.</td>
<td>P2/0.5 Bar</td>
<td>Similar: Missing orientation: Building Bridging (innovating while being mindful of current capabilities for implementation).</td>
</tr>
<tr>
<td>Process</td>
<td>VP2: Approaches work from unexpected angles leading to novel forms of effectiveness.</td>
<td>MP3: Bridger between &quot;out there ideas&quot; and implementation concerns, comfort with challenging system.</td>
<td>P2/0.5 Bar</td>
<td>Expansion: VP able to initiate bridges between ideas and implementation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes/Yes: &quot;Our way.&quot; Natural tendency to take control and lead others. Open to outside guidance and review. Comfortable with others taking initiative.</td>
<td>Yes/Yes: &quot;Let's get close.&quot; Initiates personal connections, engaging at levels of both head/intellect and heart/emotion.</td>
<td>Yes/Yes: &quot;Let's get close.&quot; Initiates personal connections, engaging at levels of both head/intellect and heart/emotion.</td>
<td>Flex/No (far left): Initiates adding to network depending on situation. Holds little interest in others including in different events, preferring to be left alone to achieve goals.</td>
<td>Diverge: Common for Pinggers. Formulates multitude of ideas, finding satisfaction in discovery of options. Focusses more on concepts/ideas, (keeping options open) than timetables (driving to closure).</td>
<td>Action: Common for Pingger. Acts quickly once decision made. Accept mistakes are part of learning process.</td>
<td>Flex: Able to base decisions on logic and/or values (people) depending on situation.</td>
<td>Self: Can become extremely fatigued after intense stretches with others. Time alone allows fully leveraging capacity to deeply reflect.</td>
<td>As Pinggers with preference for Divergence, rich ideas abound and abound. Missing orientations include Process Builders and Convergent thinkers for implementing and optimizing. Action orientation could drive pace too rapid for others to absorb/implement (mitigated by CEO's comfort with flexing to Prudent, depending on situation, and VP's Bridger orientation in Process).</td>
</tr>
<tr>
<td></td>
<td>Similar: Can lead empower. Supports shifting roles as needs arise and conditions change. Good fit for working with customers as partners, creating solutions.</td>
<td>Similar:Contributes to building deep relationships among constituents.</td>
<td>Complementary: Alone, CEO's low comfort could create void, but possible to distribute coverage across broad spectrum of customers, collaborators, and funders.</td>
<td>Similar: Touch points with external systems, enabling others to network. Assumes others will implement and execute.</td>
<td>Similar: Both divergent thinkers. Missing orientation: Need balancing orientation to move to convergence for implementation.</td>
<td>Expanding: CEO's tendency to be careful before proceeding (Prudent) when needed will balance the shared VP's Action tendency. Would provide planning associated with experimentation and integration into existing systems.</td>
<td>Expanding: CEO's ability to shift depending on context pushes the team beyond driving to &quot;best solution&quot; by considering those who will implement and execute.</td>
<td>Potential conflict: Misunderstanding of difference not understood and accommodated. Opportunity to divide extensive interfacial demands of the business.</td>
<td>As Pinggers with preference for Divergence, rich ideas abound and abound. Missing orientations include Process Builders and Convergent thinkers for implementing and optimizing. Action orientation could drive pace too rapid for others to absorb/implement (mitigated by CEO's comfort with flexing to Prudent, depending on situation, and VP's Bridger orientation in Process).</td>
</tr>
</tbody>
</table>
### Appendix K (continued)

**ISPI Analysis of Leadership Pairs – Charlotte A**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>p&lt;0.05 Bars</th>
<th>Analysis and Potential Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovation Orientation (OI)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>MP3: <strong>Bridger</strong>, Tolerance for ideas of pioneer and appreciation of established norms.</td>
<td>MB2: <strong>Bridger</strong>, Understands value of systems but also intrigued by the new.</td>
<td>MP1:2/5 Bars</td>
<td>Complementary: Quality mirror images, straddling midline in total and inputs. Missing orientation: Ponder in Innovation and Risk; possibly preference of co-founder, CEO (unknown).</td>
</tr>
<tr>
<td><strong>Adaptation</strong></td>
<td>MP3: Produces original ideas and approaches old problems with fresh perspectives. Capacity to translate novelty into necessity.</td>
<td>MB1: <strong>Bridger</strong>, Generates sufficient number of ideas. Prefers comfort of stability, continuity, and consistency. Considers novelty for relevance to problem at hand.</td>
<td>MP2:1/5 Bars</td>
<td>Complementary: Possibility to seek high impact opportunities to expand on what works well and fill openings in marketplace.</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>MP2: <strong>Bridger</strong>, Unique capacity to translate novelty into necessity. Takes calculated risks in breaking rules and challenging &quot;the system&quot; while working in it. Work in teams, offering ideas and watching impact on others.</td>
<td>MB3: <strong>Bridger</strong>, between upholding values and adapting to changing conditions. Looks inside paradigm and open to reaching outside. Able to create new ways of reaching goals.</td>
<td>MB1:2 Bars</td>
<td>Complementary.</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>MP3: <strong>Bridger</strong>, between spontaneity and consistency. Interpret pioneer ideas into language builders can use. Bring order into unstructured situations.</td>
<td>MB3: <strong>Bridger</strong>, Interprets pioneer ideas for implementation. Optimizes how to get things done. Translates new ideas into existing structure.</td>
<td>MP1:2.5 Bars</td>
<td>Complementary: Potential to cover projects across innovation continuum.</td>
</tr>
<tr>
<td><strong>Affective: Control</strong></td>
<td>Yes/Yes: &quot;My way.&quot; Sets directions, develops guidelines and lead people. Operates most efficiently with high autonomy.</td>
<td>No (next to) Flex/Yes: &quot;Your way.&quot; Little interest in influencing decision process. Desires to contribute abilities to collective whole.</td>
<td></td>
<td>Complementary: Effective for a smooth hand-off when direction is well defined. Blinds spots: Decide-act handoff could bypass rapid iterations necessary in radical innovation, or CEO's maintaining control could distract from attending to pioneering efforts.</td>
</tr>
<tr>
<td><strong>Affective: Relationship</strong></td>
<td>Yes/Flex: Initiates personal connections, engaging at levels of both head/intellect and heart/emotion. Creates bond to relate more effectively, allowing better understanding, and developing trust. Openness to others approaching depends on situation.</td>
<td>Flex/No: Assesses cues before entering. Has a few close working relationships; values privacy.</td>
<td></td>
<td>Extending.</td>
</tr>
<tr>
<td><strong>Affective: Networking</strong></td>
<td>No/Yes: &quot;If suits your need.&quot; Does not actively seek out. Prefer to &quot;know a few good people.&quot; Desires inclusion and awareness of key information.</td>
<td>Flex/Flex: Varies efforts depending on situation.</td>
<td></td>
<td>Potential blind spot: As grow business, may need to extend networks to various constiuencies. Missing orientation: Yes/Yes (CEO co-founder may fill, unknown).</td>
</tr>
<tr>
<td><strong>Cognitive: Input</strong></td>
<td>Flex: Comfortable receiving input via sensing (details) or intuitive (big picture) skills. Visionary: Begins with prime objective; a vision of possibilities serves greater purpose than details. Pinggers tend to be visionary.</td>
<td>Visionary: Begins with prime objective; a vision of possibilities serves greater purpose than details. Pinggers tend to be visionary.</td>
<td></td>
<td>Extending.</td>
</tr>
<tr>
<td><strong>Cognitive: Flow</strong></td>
<td>Converge: Prefers to plan, schedule, and hit timelines. Focuses on best practices to solve a problem efficiently.</td>
<td>Flex (closer to Diverge): Possesses capacity to work toward defined solution or to keep options open depending on situation. Less common for Pinggers (who tend be divergent thinkers) - XB on Process may explain Converge tendency.</td>
<td></td>
<td>Extending.</td>
</tr>
<tr>
<td><strong>Cognitive: Output</strong></td>
<td>Flex: Able to base decisions on logic and/or values (people) depending on situation.</td>
<td>Head: Looks at matters rationally with facts and logic. Seeks to deliver functional and efficient solutions.</td>
<td></td>
<td>Extending: Strong opportunity to leverage differences for synergistic affects.</td>
</tr>
<tr>
<td><strong>Cognitive: Energy</strong></td>
<td>People: Energized being around other people. Process thoughts and ideas in conversation with others.</td>
<td>Self: Can become extremely fatigued after intense stretches with others. Time alone allows fully leveraging capacity to deeply reflect.</td>
<td></td>
<td>Potential conflict: Misunderstanding if difference not understood and accommodated. Opportunity to assign efforts to leverage preferences and support optimal thinking/exercising.</td>
</tr>
<tr>
<td><strong>Descriptors/ Summary</strong></td>
<td>&quot;Architect&quot; Visionary: Head. Open to new intriguing problems, works well with ideas. Complex problems from logical perspective.</td>
<td>&quot;Architect&quot; Visionary: Head. Open to new intriguing problems, works well with ideas. Complex problems from logical perspective.</td>
<td></td>
<td>Strong complementary aspects along iO orientations enable connecting and translating pioneering ideas into details of design and implementation. In turbulent times, may lack someone to generate breakthrough ideas or create a new paradigm (Pingger). Blind spot in networking could present difficulties in growth and diversification/renewal.</td>
</tr>
</tbody>
</table>
## Appendix K (continued)

### ISPI Analysis of Leadership Pairs – Charlotte B

<table>
<thead>
<tr>
<th>ELT-B</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>µ=3 Bars</th>
<th>Analysis and Potential Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Innovation Orientation (iO)</strong></td>
</tr>
<tr>
<td>Total</td>
<td>Converge:</td>
<td>MP2: Bridger between Pioneer Ideas and Builder's implementation. Generator of expansionary ideas to build on current capabilities.</td>
<td>P2: Preferences working on new problems/ideas and breakthrough projects.</td>
<td>MP3/1 Bar</td>
</tr>
<tr>
<td></td>
<td>P3:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ideation</td>
<td>MB2: Tends to improve with eye toward precedent. Find it easy to generate sufficient number of solutions. Consider novelty for clear relevance to problem at hand. Prefer change in controlled manner.</td>
<td>P1: Prolific idea generator. Fresh perspective on old problems. Prefers to create than improve. Comfortable with several new idea problems at same time. Tangential thinker with unexpected approaches.</td>
<td>P2/2.5 Bars</td>
<td>Complementary. Large difference may require cues bridging effort between Pioneer-Ponger's new paradigms and builder's continuous improvement thinking may require communication effort and trust. Synergies possible for Pioneer to expand ideas and Bridger Builder to add points and insights.</td>
</tr>
<tr>
<td>Risk</td>
<td>MB1: Bridger between consistency and spontaneity. Helpful for interpreting Pioneer's output: to put ideas into action and translating new data events into existing structures. Optimizing how to get things done. Prefers to work in linear fashion.</td>
<td>P3: Unconventional. Irreverence toward accepted codes and &quot;the system&quot; can make catalyst for change.</td>
<td>P3/0.5 Bars</td>
<td>Similar. CEO is next to XP line, the only O where sits to right of COO.</td>
</tr>
</tbody>
</table>

### Innovation Orientation Modifiers (iOM)

| Affective: | Control Of Others Initiate | Yes/Yes: "One way." Natural tendency to take control and lead others. Open to outside guidance and review. Comfortable with others taking initiative. | Yes/Yes: "Sometimes my way." Pongers more likely to initiate/take control. Maintains balanced approach to allowing others to control, depending on situation. | Similar: Can lead or empower. Supports shifting roles in leadership team as needs arise and conditions change. Good fit for working with customers as partners, creating solutions. |
| Affective: | Relationship -6 Others Initiate | Flex/No: Assesses cues before approaching. Values privacy, others approaching could be intrusion. | Yes (far right)/Yes: "Let's get close." Initiates personal connections, engaging at levels of both head/intellect and heart/emotion. Creates bond to relate more effectively, allowing better understanding and developing trust. Openness to others approaching depends on situation. Welcomes being approached by others, not an intrusion. | Extending: COO can cover wide range of relationships as grow company, especially when CEO's preferences or energy does not support. |
| Affective: | Networking -6 Others Initiate | Yes (far right)/No: "If it suits my needs." Recognizes potential of large network. Seeks connections actively. Welcomes inclusion and being made aware. Response to others approaching depends on situation. | Yes/Flex: Recognizes potential of large network. Seeks connections actively. Welcomes inclusion and being made aware. Response to others approaching depends on situation. | Complementary: Together can cover variety of constituencies. Blind spot: CEO focused in task mode and COO does not sense an issue or opportunity seeking to gain attention but from unexpected direction. |
| Cognitive: | Input | Flex: Sometimes processes specific details and other times prefers to begin with the "big picture." Able to adjust to situational cues or others' preferences. | Visionary: Begins with prime objective; a vision of possibilities serves greater purpose than details. Pongers tend to be visionary. | Extending: Vision guides direction. Flex orientation contributes attention to detail. |
| Cognitive: | Flow | Flex: Possesses capacity to work toward defined solution or to keep options, open depending on situation. Less common for Pongers (who tend to be divergent thinkers) | Flex: Possesses capacity to work toward defined solution or to keep options, open depending on situation. Less common for Pongers (who tend to be divergent thinkers) | Extending: Presence of convergent thinking provides impetus to bring ideas to close and move ideas to fruition. |
| Cognitive: | Passion | Dependencies: Able to spring into action or take time to process ramifications. | Action: Common preference for Ponger. Act quickly once decision made; may become impatient if not moving fast enough. Accept mistakes are part of learning process. | Complementary: COO's comfort with action provides spark to ignite. CEO provides balance, moves things along, and ensures attention to implementation detail. |
| Cognitive: | Output | Flex: Able to base decisions on logic and/or values (people) depending on situation. Interpreter/Bridger between business strategy and encouraging people. | Self: Can become extremely fatigued after intense stretches with others. Time alone allows fully leveraging capacity to deeply reflect. | Similar. |

### Descriptors/Summary

|                  | Strong team, seeming to unfold together in an overall cognitive dance. Largest difference seen in ideation (2.5 bars and crossing center line), providing potential for collaboration, if can frame ideas for other's understanding. Possible blind spot in Networking, an important area for comprizes in early stages. |                  |                  |                  |
## Appendix K (continued)

### ISPI Analysis of Leadership Pairs – Charlotte C

<table>
<thead>
<tr>
<th>Pair</th>
<th>MP2/0.5 Bar</th>
<th>MP1/1 Bar</th>
<th>MP3/0.5 Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>MP2: Bridge between Pioneer Ideas and Builder's implementation. Generator of expansionary ideas to build on current capabilities.</td>
<td>MP1: Bridge between Pioneer Ideas and Builder's implementation. Generator of expansionary ideas to build on current capabilities.</td>
<td>MP3: Bridge. Unique capacity to translate novelty into necessity. Take calculated risks in breaking rules and challenging &quot;the system&quot; while working on it. Work in teams, offering ideas and watching impact on others.</td>
</tr>
<tr>
<td>Ideation</td>
<td>MP2: Recognize need to respond to changing conditions, can produce original ideas and approach problems with fresh perspectives.</td>
<td>MP1: Recognize need to respond to changing conditions, can produce original ideas and approach problems with fresh perspectives.</td>
<td>MP3: Recognizes need for efficiency and stability so can translate new ideas into terms supporting impact on others.</td>
</tr>
<tr>
<td>Risk</td>
<td>MP2: Bridge. Unique capacity to translate novelty into necessity. Take calculated risks in breaking rules and challenging &quot;the system&quot; while working on it. Work in teams, offering ideas and watching impact on others.</td>
<td>MP3/0.5 Bar</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>MP2: Recognize need for efficiency and stability so can translate new ideas into terms supporting consistency. Capable of bringing order into unstructured situations. Able to approach from unexpected angles or be methodical.</td>
<td>MP3: Recognizes need for efficiency and stability so can translate new ideas into terms supporting consistency. Capable of bringing order into unstructured situations. Able to approach from unexpected angles or be methodical.</td>
<td>MP3: Recognizes need for efficiency and stability so can translate new ideas into terms supporting impact on others.</td>
</tr>
</tbody>
</table>

### Innovation Orientation Modifiers (IOM)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>Analysis and Potential Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective:</td>
<td>Yes/Yes: “Our way.”</td>
<td>Yes/Yes: “My way.”</td>
<td>Extending. Each takes initiative. CEO seeks to input and feedback. VP drives projects to completion.</td>
</tr>
<tr>
<td>Control:</td>
<td>Yes/Yes.</td>
<td>Yes/Yes.</td>
<td></td>
</tr>
<tr>
<td>Others Initiate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship</td>
<td>Yes/Yes: “Let’s get close.”</td>
<td>Yes/Yes: “Let’s stay connected.”</td>
<td>Complementary: CEO’s low comfort with Others Initiative may create a void, but VP could fill. Opportunity to allocate coverage across broad spectrum of customers, collaborators, and funders.</td>
</tr>
<tr>
<td>Networking:</td>
<td>Yes/No: Recognizes potential of large network.</td>
<td>Yes/Yes: “Let’s stay connected.”</td>
<td></td>
</tr>
<tr>
<td>Others Initiate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complementary:</td>
<td>CEO’s low comfort with Others Initiative may create a void, but VP could fill. Opportunity to allocate coverage across broad spectrum of customers, collaborators, and funders.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive: Input</td>
<td>Flex: Comfortable with processing specific details or beginning with “big picture.”</td>
<td>Flex: Comfortable with processing specific details or beginning with “big picture.”</td>
<td></td>
</tr>
<tr>
<td>Cognitive: Flow</td>
<td>Flex (toward Converge): Possesses ability to work toward defined solution or keep options open.</td>
<td>Flex (toward Converge): Possesses ability to work toward defined solution or keep options open.</td>
<td></td>
</tr>
<tr>
<td>Cognitive: Output</td>
<td>Flex: Able to move between logic or people-based decision-making, depending on situation.</td>
<td>Flex: Able to move between logic or people-based decision-making, depending on situation.</td>
<td></td>
</tr>
<tr>
<td>Descriptions/Summary</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes
- MP2: Missing orientation: Builder. Unique capacity to translate novelty into necessity. Take calculated risks in breaking rules and challenging "the system" while working on it. Work in teams, offering ideas and watching impact on others.
- MP3: Missing orientation: Builder who relishes role of optimizing.
### ISPI Analysis of Leadership Pairs – Charlotte D

<table>
<thead>
<tr>
<th>CLT-D</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>n=3 Bars</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovation Orientation (IO)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>P1: Challenges problem definition. Manipulates problems by questioning assumptions. Close to Pinger (next to line</td>
<td>MP2: Bridge between Pioneer ideas and Builder's implementation.</td>
<td>MP3/1 Bar</td>
<td>Extending: Able to move ideas to implementation, covering wider range of innovation continuum. CEO comfortable bridging to a Pinger.</td>
</tr>
<tr>
<td><strong>Ideation</strong></td>
<td>MP3: Bridge of Pioneer's paradigm-breaking ideas and Builder's preservation of established norms. Able to produce original ideas and fresh perspectives while appreciating existing systems.</td>
<td>MP2: Bridge of Pioneer's paradigm-breaking ideas and Builder's preservation of established norms. Able to produce original ideas and fresh perspectives while appreciating existing systems.</td>
<td>MP3/0.5 Bar</td>
<td>Similar: Same comfort zone in generating ideas for evolution or expansion. Able to generate ideas building and expanding on current capabilities. Missing orientation: Pioneer.</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>MP3: Bridge. Unique capacity to translate novelty into necessity. Take calculated risks in breaking rules and challenging &quot;the system&quot; while working in it. Work in teams, offering ideas and watching impact on others.</td>
<td>P2: Can be catalyst for change, seeing rules as a challenge. Approaches tasks from unexpected angles. Comfortable with unstructured situations and disagreeing with group consensus. Does not see own actions as risky.</td>
<td>P1/1 Bar</td>
<td>Extending.</td>
</tr>
</tbody>
</table>

#### Innovation Orientation Modifiers (IOM)

| Affective: | Control | Yes (far right)/Yes: "Our way." Natural tendency to take control and lead others. Open to outside guidance and review. Comfortable with others taking initiative. | Extending. Each takes initiative. CEO seeks to input and feedback. VP drives projects to completion. |
| Affective: | Relationship | Yes/Flex: Initiates personal connections, engaging at levels of both head/intellect and heart/emotion. Creates bond to relate more effectively, allowing better understanding, and developing trust. Openness to others approaching depends on situation. | Flex/Flex: Depends on situational cues. | Similar. |
| Affective: | Networking | Yes/Yes: "Let's stay connected." Seeks large breadth of contacts and welcomes awareness of relevant information. Prefers to give input on decisions. | So (next to Flex)/Flex: Prefers to develop network of "a few good people" for collaboration when needed. Situation determines desire to be included. | Potential conflict: VP's low comfort in networking in this area, critical in early stages especially while exploring new horizons. CEO may expect/require. |
| Cognitive: | Input | Visionary and Flex: Values seeing big picture/prime objective first. Considering possibilities serves greater purpose than finite details when designing systems. Possesses capacity to work toward defined solution or keep options open depending on timeline. | Flex: Sometimes processes specific details and other times prefers to begin with the "big picture." Able to adjust to situational cues or others' preferences. (Builders in Process tend to be Concrete). | Expanding. |
| Cognitive: | Flow | Flex: Possesses capacity to work toward defined solution or keep options open depending on situation. | Converge: Prefers to plan, schedule, and be timelines. Focuses on best practices to solve a problem efficiently. Often found with Builders in Process (comfort with Concrete). | Missing orientation: Diverge to avoid closing option generation/exploration pre-maturely (without rigorous experimentation). |
| Cognitive: | Output | Flex (closer to Heart): Able to base decision on logic and/or values (people) depending on situation. Interpreter/Bridge between business strategy and encouraging. | Flex (next to Head): Able to base decisions on logic and/or values (people) depending on situation. Interpreter/Bridge between business strategy and encouraging people. | Complementary: Tendency of one toward heart balances with head of other. |

#### Descriptors/Summary