2018

Leadership Skills to Sustain High-Tech Entrepreneurial Ventures

Zoaib Z. Rangwala
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Zoaib Rangwala

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Christopher Beehner, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Timothy Malone, Committee Member, Doctor of Business Administration Faculty

Dr. Judith Blando, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2018

Abstract

Leadership Skills to Sustain High-Tech Entrepreneurial Ventures

by

Zoaib Z. Rangwala

MBA, Santa Clara University, 1979

MS, UC Berkeley, 1976

BS, NED Engineering University, 1973

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

April 2018

Abstract

High-tech (HT) innovation-oriented entrepreneurs start 35% more ventures and create 10% more jobs in the first 5 years of operation than the rest of the private sector and drive significant economic growth across all industries; however, more than 50% of the entrepreneurial HT ventures fail during the first 5 years of operations. Guided by the conceptual framework of transformational leadership theory, the purpose of this multicase study was to explore skills used by successful entrepreneurial leaders to sustain their HT ventures in Silicon Valley, California. Data collection was from 8 participants in semistructured 1-on-1 interviews and 3 participants in a focus group discussion. All participants were entrepreneurial leaders with experience in sustaining their entrepreneurial ventures beyond 5 years. A thematic data analysis approach involved text search, content coding to nodes, and code comparison techniques of collected data to extract themes and identify relationships in the findings. The emergent 4 leadership skill themes for HT entrepreneurial venture sustainability were the recruitment of the right team, situational adaptability, market orientation, and providing innovation stimulation. The right team can resourcefully assist the leader to execute market-leading competitive products and overcome challenges in the dynamic and intensely competitive and innovative HT industry. A culture of openness, ownership, and trust is conducive to the sustainability of an HT venture. Findings from this study may contribute to social change by promoting the formation of new HT ventures, increasing job creation, reducing work stressors, improving quality of life with innovative and cost-effective products, and services in healthcare, infrastructure, personal safety, education, and communications.

Leadership Skills to Sustain High-Tech Entrepreneurial Ventures

by

Zoaib Z. Rangwala

MBA, Santa Clara University, 1979

MS, UC Berkeley, 1976

BS, NED Engineering University, 1973

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

April 2018

Dedication

I dedicate this study to the memory of my beloved parents, Zainuddin and Fizza Rangwala, who started and nurtured me along my education path with tremendous love and blessings. This dedication is also to my three lovely and talented daughters, Fatema, Maryam, and Zainab, for consistently encouraging and helping me to pursue my doctorate more than 30 years after I received my previous degree, an MBA. This doctoral study is for my dear wife, Jumana, who was a constant source of strength and support in enabling me accomplish my doctoral journey. I hope that my achievement will be an inspiration to my family in the coming generations, beginning with my first grandchild Mustansir, as a symbol of attaining success with discipline, diligence, perseverance, and goal commitment.

Acknowledgments

I express deep gratitude to my chair, Dr. Chris Beehner, for his encouragement, guidance, mentoring, and facilitating and championing my work. My appreciation is also for Drs. Tim Malone and Judith Blando, the Second Committee Member (SCM) and University Research Reviewer (URR) respectively of my study committee, and my previous Chair, Dr. Charlene Dunfee and URR, Dr. Lynn Szostek, for shepherding me as I navigated and overcame challenges at different stages of my study. Special thanks and gratitude go out to the study participants for their time and courtesy and the company leaders who graciously permitted me to conduct the study on their company premises.

Table of Contents

List of Tables

List of Figures

Section 1: Foundation of the Study

High-tech (HT) innovation-oriented entrepreneurs start 35% more ventures and create 10% more jobs in the first 5 years of operation than the rest of the private sector (Hathaway, 2013). The results of the Doctorate of Business Administration (DBA) doctoral study add to the existing body of knowledge on HT entrepreneurial venture sustainability in the initial 5 years of operations. I explored, using a qualitative study method and case study design, the phenomenon of leadership skills and extracted themes regarding contextual leadership skills used by successful entrepreneurial leaders to sustain their HT ventures during the initial 5 years.

Background of the Problem

Innovators drive economic growth with job creation and market introduction of innovative new products and services, thereby increasing labor productivity and company operational performance, which are conducive to preventing an economic recession (Popa & Vlasceanu, 2014). Innovation benefits growth of industries in all sectors, jobs, and economies (Krishna & Subrahmanya, 2015; Simonen, Svento, & Juutinen, 2015). Investing heavily in radical and disruptive innovation, HT entrepreneurs generate competition and business changes, but their ventures suffer a high failure rate of over 50% in the process (Löfsten, 2016; Simonen et al., 2015). Such intense competition requires superior leadership skills to manage venture sustainability (Colombelli, Krafft, & Vivarelli, 2016). Effective leadership skills could reduce the high failure rate with operative innovation commercialization activities (Yu, Chen, & Nguyen, 2014).

Open innovation is vital for superior HT venture performance and requires collaboration between entrepreneurs' in-company innovation endeavors with complementary innovation activities of external partners to enhance value and performance of their own innovations and achieve success (Wang, Chang, & Shen, 2015). Global competitive pressures and constant change make continuous innovation an imperative for venture survival (Ashraf & Khan, 2013). Effective

business resource management across the organization is essential for survival and growth of early stage entrepreneurial ventures (Ng, Macbeth, & Southern, 2014).

Entrepreneurs need varied and balanced operational skills to execute the diverse tasks necessary for the creation of a sustainable business venture (Chen & Thompson, 2015). Harnessing external human capital and managing the interaction of the team's abilities, business operational experiences, and the quality of the product ideas are critical elements in the creation and sustainability of an HT entrepreneurial venture (Gill & Larson, 2014; Vandenbroucke, Knockaert, & Ucbasaran, 2016). An entrepreneur's management skills are critical resources for venture sustainability, fundamentally determining strategic decisions and implementations (Asah, Fatoki, & Rungani, 2015). Thus, a composite set of leadership skills helps HT entrepreneurs.

Problem Statement

HT entrepreneurs require unique leadership skills to address sustainability challenges due to a highly competitive and dynamic market environment (Colombelli et al., 2016). More than 50% of HT entrepreneurial ventures fail during the first 5 years of operations, often due to a skill-deficient leadership (Löfsten, 2016). The general problem is that the highly competitive and dynamic market environment of the HT industry negatively affects some HT entrepreneurs, which results in failures of their ventures. The specific business problem is that some HT entrepreneurial leaders lack leadership skills to sustain their HT ventures during the first 5 years of operations.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the leadership skills HT entrepreneurial leaders use to sustain their ventures during the first 5 years of operations. The targeted population was 11 entrepreneurial leaders located in Silicon Valley (SV), California, who possess leadership skills that have sustained their HT business during the first 5 years of operations. The implication of the study's findings on leadership skills includes the potential of

increased HT venture longevity. The implications of enhanced venture sustainability for positive social change are job creation and economic growth contributing to the socioeconomic stability of individuals and their communities globally.

Nature of the Study

I used the qualitative method for my study. Qualitative researchers explore a phenomenon using open-ended interviews for an in-depth exploration of human knowledge through the articulation of participants' experiences to extract themes (Denzin & Lincoln, 2011; McCusker & Gunaydin, 2015; Park & Park, 2016). In contrast, quantitative researchers use close-ended questions to examine variable relationships and differences through testing hypotheses (Campos, 2016; Park & Park, 2016; Yilmaz, 2013). Exploration of leadership skills requires an understanding of participants' experiences. Creating numerical interpretations of human behaviors may ignore critical issues that are not quantifiable. Therefore, the quantitative method was not applicable. Mixed methodologists integrate both research methods in a single study (McCusker & Gunaydin, 2015). The inapplicability of the quantitative component for the study made the mixed methods approach unsuitable for the study

I considered four research designs for the qualitative study: Ethnographic, phenomenology, narrative, and case study. In an ethnographic design, the focus is on gaining insights into everyday practices and behavior patterns of group cultures through interviews and observations (Brooks & Alam, 2015). The study was not about understanding group cultures and, therefore, the ethnographic design was not applicable to the study. In a phenomenological design, the concentration is on the meanings of individuals' lived experiences (Khan, 2014), while narrative researchers seek to describe the lives of individuals in biographies through interviews and participant observations (Lewis, 2015). The phenomenological and narrative research designs did not align with the study. The case study research design is appropriate for addressing *what, how,*

and *why* research questions as empirical inquiries to explore a phenomenon and identify themes (Yin, 2017). For the study, therefore, the case study research design was appropriate to explore the phenomenon via what and how inquiries.

Research Question

What leadership skills do HT entrepreneurs use to sustain their ventures during the first 5 years of operations?

Interview Questions

1. How do you define leadership skills required to support HT ventures during the first 5 years of operations?
2. What are the barriers to applying leadership skills to sustain HT ventures in the first 5 years of operations?
3. How did you address each barrier?
4. What key leadership skills are necessary to sustain HT ventures during the first 5 years of operations?
5. Which of these leadership skills proved to be most effective?
6. How did you learn about leadership skills that support HT ventures during the first 5 years of operations?
7. What other related information would you like to share that, based on your experience, could be helpful in understanding leadership skills for sustaining HT ventures during the first 5 years of operations?

Conceptual Framework

I used the transformational leadership (TFL) theory as the conceptual framework for the intended study. Burns in 1978 conceptualized the TFL theory. TFL is most often applied in contemporary business practice because of people-centric constructs of employee professional

growth and satisfaction, and teamwork (Dinh et al., 2014). A transformational leader exerts a positive impact on organizational creativity, intellectual stimulation, and innovation (Hu, Gu, & Chen, 2013). The TFL framework embeds the characteristics of trust, charisma, vision, organizational learning, for enhancing the new product development (NPD) process (Sattayaraksa & Boon-itt, 2016; Taylor, Cornelius, & Colvin, 2014). Among different strategic leadership styles, TFL style has the strongest impact on team and firm performance because of individual consideration, team building, intellectual stimulation, and goal orientation characteristics (Özer & Tınaztepe, 2014).

The TFL characteristics of promoting organizational creativity and learning, stimulating innovation, and superior team NPD performance are the underpinnings of an HT entrepreneurial venture (Sattayaraksa & Boon-itt, 2016; Sun, Xu, & Shang, 2014; Yu, Chen, & Nguyen, 2014; Yu, Hao, Ahlstrom, Si, & Liang, 2014). Organizational innovation imparts a competitive advantage to an HT venture (Ashraf & Khan, 2013). Such TFL attributes are, therefore, expected to be imperative for HT venture sustainability in the fast changing, highly competitive, and disruptively innovative HT industry. Leadership skills based on TFL constructs could help entrepreneurs evaluate and proactively counter external threats and internal challenges to guide their HT venture toward long-term sustainability. The TFL conceptual framework, encompassing primary constructs of project, servant, paternalistic, systems, and entrepreneurial leadership frameworks was pertinent to this study.

Operational Definitions

The following definitions of terms are applicable to the study:

Angel investor: Investments by wealthy individuals, also known as business angel and angel financing, into start-up HT companies are angel investments (Hellmann & Thiele, 2015).

Cluster of innovation: Economic hot spot geography where new technologies evolve at a significantly high rate in an ecosystem brimming with capital, expertise, and talent, fostering the development of new industries and ways of doing business (Engel, 2015).

Creative destruction: Schumpeter in 1934 conceptualized creative destruction as reduction in value, replacement, and or obsolescence of existing knowledge, skills, and resources of process and product technologies with radical or disruptive innovation leading to the creation of new processes, products, and potentially, new industries (Abernathy & Clark, 1985).

Crowdfunding: Online platform-mediated aggregation of many small investors for providing multiple levels of financing to entrepreneurs (Bruton, Khavul, Siegel, & Wright, 2015).

Disruptive innovation: A disruptive innovation is the invention of something new that underperforms according to the criteria customers have functionally valued and at the same time brings some new performance attributes to the market (Sandström, Berglund, & Magnusson, 2014).

Entrepreneurial bricolage: Improvising activity by using combinations of the resources at hand to solve new problems and harvest opportunities (Stenholm & Renko, 2016).

High-tech (HT) entrepreneurial venture: A company based on innovation and founded by an entrepreneur to pursue profit-oriented opportunities without regard to the resources they currently control (Giannantonio & Hurley-Hanson, 2016).

Knowledge economy: In the 21st global economy ideas and knowledge of the workers are the preeminent business resource to innovate and compete effectively in the increasingly complex and rapidly changing market environment (Johannessen & Skålsvik, 2013).

Leadership: The process of interactive influence that occurs when, in each context, some people accept one person as their leader to achieve common goals (Silva, 2016).

Regional cluster: A regional cluster consists of groups of complementary industries operating in an ecosystem within a specific region (Delgado, Porter, & Stern, 2014).

Sharing economy: Segments of the population can collaboratively make use of underused asset inventory via fee-based sharing in which individuals provide short-term rentals discretionally and consumers benefit from lower costs on an as-needed basis (Zervas, Proserpio, & Byers, 2017).

Siliconia: Description of a regional technology hub developed in the image of SV, CA, and designated by merging the silicon name with a local geographic feature such as Silicon Hills in Texas or Silicon Wadi in Israel (Gill & Larson, 2014).

Sustaining innovation: A sustaining innovation is a product or technological improvement based on the criteria that customers have historically valued (Sandström et al., 2014).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions in a study are assumed truths which are not verifiable by or under the control of the researcher but are necessary to perform the study (Denzin & Lincoln, 2011; Walden University, 2016). For the study, I assumed that each participant provided truthful and unbiased answers about personal experiences. Each participant thought before giving an answer, taking time to recall events, and elucidated further if I requested. The demeanor of and concentration in answering questions by a participant, which I recorded in the study journal, lends credence to my assumptions regarding the participant's honesty, integrity, and openness in contributing information for the study. As shown in the findings and themes, the information provided by the participants was pertinent and comprehensive and provided value to the study of what leadership skills HT entrepreneurial leaders use to sustain their HT ventures during the first 5 years of operations.

Limitations

Limitations of the study are potential weaknesses of the study (Denzin & Lincoln, 2011). The geographic location of the study was SV (the basis of Siliconia), CA. Cultural, regional cluster, infrastructure, and other differences may potentially limit the study outcome to other regions of the U.S. and globally. Another limitation is the collected data were not exhaustive to encompass all leadership skills used in the first 5 years of HT entrepreneurial ventures. Inaccurate recollection by participants was a potential limitation.

Delimitations

Delimitations are boundary conditions that a researcher uses to define the scope of a study (Denzin & Lincoln, 2011). The bounds of the study were the SV, CA geography, and participants were entrepreneurial leaders of HT ventures from area HT entrepreneurial venture organizations who sustained their ventures for over 5 years. The time between Institutional Review Board (IRB) approval and study completion took place over six months because of delays in setting up participant appointments, but I preserved the defined bounds of the study. The sustainability of entrepreneurial ventures in other industries and business sectors was outside the scope of the study.

Significance of the Study

The entrepreneur as a leader and innovator combines creativity and a proactive attitude (Colombelli et al., 2016; De Jong & Marsili, 2015). Slavik, Putnova, and Cebakova (2015) posited that leadership included strategic corporate management. Leadership constructs include an organization culture of learning and innovation, improved team performance, increased organizational effectiveness, and enhanced survivability of HT entrepreneurial ventures in the initial 5 years (Ashraf & Khan, 2013; Colombelli et al., 2016; Sattayaraksa & Boon-itt, 2016). The findings of the study, therefore, potentially show HT entrepreneurs what leadership skills are essential for venture sustainability in the first 5 years of operation. The implication for business

practice, therefore, portends increased survival rates of HT entrepreneurial ventures during the first 5 years of operation.

HT venture entrepreneurs produce significantly more jobs than management of incumbent firms and other types of startups (Hathaway, 2013; Tsvetkova, Thill, & Strumsky, 2014). According to Chiaroni, Chiesa, Franzò, Frattini, and Urbinati (2016), and Christensen, McDonald, Altman, & Palmer (2016), HT entrepreneurs affect positive social change by innovatively creating cost-effective, customer-centric, accessible, and functional value products and services benefiting individuals and communities in healthcare, infrastructure, and information and communications. Colombelli et al. (2016), Hu et al. (2013), and Paulsen, Callan, Ayoko, and Saunders (2013) suggested improved leadership skills could encourage the innovative spirit of HT entrepreneurs to form new ventures. The findings of this study, therefore, could support HT entrepreneurial leaders with leadership skills that support their venture sustainability during the first 5 years of operations, affecting positive social change with job creation and improved quality of life for venture employees, their families, and their resident communities.

A Review of the Professional and Academic Literature

The objective of this qualitative multiple case study was to explore the leadership skills HT entrepreneurial leaders use to sustain their ventures during the first 5 years of operations. The literature sources for the study were from scholarly journals with a focus on topics related to the conceptual framework of leadership and entrepreneurial venture sustainability. Such topics included leadership, innovation, business, entrepreneurship, management, organization, and venture funding. The referenced journals contained research articles by international scholars published in many countries. I analyzed and synthesized the literature regarding the various topics by discussing the research methods, data collection, and findings pertaining to the conceptual framework of leadership and related topics.

The literature search comprised business and management databases (DBs) accessible through the Walden Library and Google Scholar, with emphasis on sources from the Emerald and SAGE Premier DBs that have all peer-reviewed articles, as well as Business Source Complete and ProQuest DBs. Additional sources were Walden Library eBooks and government websites for the Small Business Administration (SBA) and Bureau of Labor Statistics (BLS). Ulrich's Periodicals Directory provided confirmation of the peer-reviewed status of reference journals and other publications. Seminal scholarly books on qualitative research, leadership, and innovation added to the literature.

Keywords used in the literature search were words and synonyms based on the conceptual framework of TFL and project, servant, paternalistic, systems, and entrepreneurial leadership frameworks. Additional keywords used in literature search pertained to HT venture sustainability criteria of innovation, organization, entrepreneurial business failures, entrepreneur, capital funding, management, and technology. Keywords included *transformational*, *strategic*, *systems*, *project*, *servant*, *ambidextrous*, *team and shared*, and *paternalistic*. *Disruptive innovation*, *reverse innovation*, *cost innovation, innovation management*, *incumbents*, and *emerging markets* were keywords for disruptive innovation strategies. *Venture capital*, *bootstrapping*, *angel investor*, *entrepreneurial financing*, *capital structure*, *crowdfunding*, *success and failure*, *risk and uncertainty*, *decision-making*, and *entrepreneur experience* were keywords pertaining to HT entrepreneurship sustainability. *Organization structure and culture*, *new product development*, *commercialization*, *organization learning,* and *market adaptability* were keywords for sources on contemporary organizations.

I ensured that the scholarly and professional sources referenced in the literature review were 85% peer-reviewed and had publication dates within 2014 and 2018. The 72 peer-reviewed sources comprise 93.51% of the 77 total sources and publication dates of 85.71% of the reference

articles and professional sources are within 5 years of expected Chief Administrative Officer (CAO) approval date. Table 1 shows the summary of the sources in the literature review with information on the publication dates of the sources. Correspondingly, in the full study there are 149 total sources with 89.93% peer reviewed sources and 88.59% of sources with publication dates within 5 years of anticipated CAO approval date.

Table 1

Frequency and Percentage of the Study Sources in Literature Review

Resources	References		Total	Percent
	Within 5 years	Older than 5 Years		
Books	3	2	5	
Dissertations	0	0	0	
Peer-Reviewed Articles	63	9	72	93.51%
Government	0	0	0	
Other Resources	0	0	0	
Total	66	11	77	85.71%

Analysis of the literature regarding the conceptual framework of TFL to give a context for the case study follows. I present an analysis and synthesis of the literature regarding the themes of leadership skills that HT entrepreneurs use to sustain their entrepreneurial ventures in the first 5 years of operation. The organization of the review follows the requirements in the DBA Doctoral Study and Rubric Research Handbook of Walden University (WU).

Application to the Applied Business Problem

The intent of this qualitative multiple case study was to explore the leadership skills HT entrepreneurial leaders use to sustain their ventures during the first 5 years of operations. The

population was 11 entrepreneurial leaders located in Silicon Valley, California who possess leadership skills that have sustained their HT business during the first 5 years of operations. The implication for positive social change include the identification of the potential leadership skills successful HT startup leaders use in sustainability and job creation through increased organizational longevity to increase the socioeconomic stability of their employees and families, and the communities of their organizations' locales.

Literature Regarding the Conceptual Framework of Leadership

The conceptual framework of TFL guided the study and my review of the literature was on TFL and other pertinent leadership frameworks mentioned in the conceptual framework. McCleskey (2014) argued that a single definition of leadership was difficult because the correct applicable definition depended on the type of problem or situation under study and the interest of the researcher. I therefore review the leadership concepts relating to the specific business problem embodied in the research question.

Literature of the Theme of Transformational Leadership for Venture Sustainability

Burns in 1978 defined TFL, differentiated it from and claimed it to be superior to the then prevalent transactional leadership (TCL) framework in a comparison of the features of the two frameworks as detailed by Lussier and Achua, (2015) and Mesu et al.(2015). According to Mesu et al., Burns conceptualized transformational leaders as providing a transcendental purpose by addressing the needs of self and followers and in the process, transforming both parties. Burns viewed TFL skills as superior to those of TCL for organizational effectiveness because of increase in motivation and productivity of followers (Lussier & Achua, 2015).

Bass (1991) conducted quantitative research in a series of surveys on leader-follower relationships in TFL and TCL leadership settings to add rigor to Burns' TFL and TCL characterizations. In a survey of leaders and employees of a large number of business and

industrial companies in Europe, Asia, and North America, Bass found that TFL characteristics were charisma, inspiration, intellectual stimulation, and individualized consideration of employee professional growth and job satisfaction. TCL characteristics were contingent rewards for performance and accomplishment, management by exception in taking corrective action for violation of rules and standards, and laissez-faire style of avoiding making decisions and abdication of responsibility, which are indicative of mediocre management performance (Bass, 1991). A quantified distinction between TFL and TCL Bass inferred was that employees exerted more than 80% extra effort under effective TFL but less than 60% nominal effort when working under TCL, confirming the superiority of TFL. The effort measurement was on the star rating of leaders on data collected in a multifactor leadership questionnaire from 228 employees of 58 managers in a large engineering firm.

Bass (1991) contended that most organizational leaders evidenced both leadership styles in their interactions and management of followers because the business arrangement characterization in TCL of employee rewards for goal accomplishment was an element of all leadership styles (Lussier & Achua, 2015; Taylor et al., 2014). Bass suggested that TFL encompasses TCL features and is a richer and more robust form of leadership for different business and company situations. Lussier and Achua argued TFL produced enduring positive transformational effects of inspired teamwork and goal orientation in the leader and followers, which has affirmative implications for the sustainability and longevity of an HT venture.

Dinh et al. (2014) conducted a qualitative review of leadership theories across the 10 top-tier scholarly journals to deduce the highest ranked five established and five emerging leadership theories in the 21st century. The top five established theories applied in contemporary business practice in the findings of Dinh et al.: Transformational and neocharismatic, leadership and information processing, social exchange and relational leadership, dispositional or trait, and

diversity and cross-cultural leadership theories. The top five emerging leadership theories according to Dinh et al. were strategic leadership, team leadership, contextual and systems leadership, leader emergence, and ethical and moral leadership. In the literature review and analysis, I discuss how TFL incorporates fundamental facets of the ranked leadership theories that Dinh et al. identified.

A literature search provided scholarly studies on the detailed aspects of TFL skills. The findings supported the positive impact of TFL on organizational team creativity, promoting innovation, effectiveness, NPD, and team and firm performance, which constitute critical issues for HT venture sustainability. Analysis and synthesis of these studies follows.

In a qualitative review of extant literature on the effects of TFL on organizational creativity and innovation, Hu et al. (2013) found direct and indirect positive effects of TFL on employee collaborative synergy, organizational team creativity, and innovation. Transformational leaders indirectly mediated and moderated creativity and innovation at four levels: individual, group, organizational, and factors in the external environment, Hu et al. found. Sattayaraksa and Boon-itt (2016) extended knowledge in literature of the link between a CEO's TFL approach and NPD success in a survey of 269 manufacturing firms in Thailand and found that there was a strong relationship between organizational learning and innovation culture. The positive implication for HT venture sustainability is that CEOs with innovation-oriented attitudes and TFL skills foster organizational learning and innovation culture.

Ashraf and Khan (2013) defined organizational effectiveness as employee's pride and satisfaction in being with the organization and contribution to the organization's monetary success. Ashraf and Khan showed that leadership innovation propensity, a feature of TFL and the driving force of an HT entrepreneur was the most significant predictor of organizational effectiveness. A transformational leader establishing open communications with individual team members will

energize the team to perform at a higher level (Özer and Tınaztepe, 2014). Using a quantitative method involving a survey of 135 executive leaders and 221 subordinates from 52 different nonprofit organizations across the U.S., Taylor et al. (2014) found correlation between visionary leadership and organization effectiveness. Superior leadership behaviors include shared vision, innovation proclivity, and entrepreneurial orientation, and therefore promote organizational effectiveness portending organization sustainability.

The high productivity and intense work efforts of employees in a TFL environment could result in the negative effect of employee burnout (Hildenbrand, Sacramento, & Binnewies, 2018). Hildenbrand et al. (2018) concluded that thriving employees at a mid-sized German manufacturing company benefiting from the openness to different work experiences, a significant company resource mitigated employee burnout. Aydogmus, Camgoz, Ergeneli, and Ekmekci (2018) inferred a higher job satisfaction in employees who are more conscientious and diligent. Aydogmus et al. found increased job satisfaction because of the effect of task ownership and responsibility through psychological empowerment in a TFL environment. Employee job satisfaction and prosperity and reduced burnout are positive outcomes of TFL.

The implications for business practice indicate that effective TFL style is contextual, has a foundation in organization operational and human resource processes, and includes varying temporal dynamics of emotions and relationships occurring within individuals and social systems. This conclusion indicates that for organizational sustainability in the dynamic, highly competitive, and intensely innovative HT industry, the adaptive characteristics of TFL are highly effective. The analysis and discussion of the literature showed that TFL is essential for innovation and implementation, which is paramount for the longevity of an HT entrepreneurial venture. Understanding the mindset and orientation of an entrepreneur, and specifically an HT entrepreneur, is essential to discern the leadership skills the entrepreneur needs to promote the sustainability of

an HT venture. Therefore, through analysis of literature sources I discuss the assessment of the entrepreneur and the HT entrepreneur characteristics, and the project, servant, paternalistic, systems, and entrepreneurial leadership concepts and models in the context of applicability for entrepreneurial HT venture sustainability.

Wang, Tsai, and Tsai (2014) investigated the correlation between followers' innovation creativity and TFL through four dimensions of TFL: Charisma, individual consideration, intellectual stimulation, and inspirational motivation. The thrust of the study was that to counter intense competition, the approach was creativity. Wang et al. revealed a strong positive correlation between such TFL characteristics and employee innovation creativity, affirming the importance of TFL for stimulating innovation. Kao, Pai, Lin, and Zhong (2015) corroborated findings of Wang et al. in research of employees in customer service focused businesses. Kao et al. deduced that TFL induced employee innovation in customer services was motivation of image and monetary gains. TFL boosts innovation because of transformational leader characteristics with projected follower gains in work satisfaction and monetary rewards in an innovation climate, thereby transforming and benefiting both agents with a sense of well-being increase of self-worth (Mesu et al., 2015).

Using the quantitative method and collecting data from the executive management of 151 Chinese manufacturing firms, Chen et al. (2014) found that technology oriented CEO supported by corporate entrepreneurship provided a positive correlation between the CEO's TFL value and the company's product innovation performance. Shafie, Siti-Nabiha, & Tan (2014) indicated that an ecosystem combining networking, TFL leadership, idea cultivation, employees' positive culture, and a learning culture boosted product innovation.

Paulsen et al. (2013) revealed that group identification and perceived leadership support for creativity independently and positively mediated the relationship between TFL and Research and Development (R&D) team innovation. The single country study findings of Paulsen et al.

conflicted with findings of Robbins and O'Gorman (2015) that R&D staff may frequently resist hierarchical leadership oversight because they seek autonomy in their work. Robbins and O'Gorman said that there were causal interconnections between innovation team leadership, innovation processes, and innovation outcomes. Another conflict regarding radical innovation by R&D staff could be the restraint on resource allocation for such activities from current company customers (Christensen et al., 2016). The findings of these studies reflect the challenges faced by established or incumbent companies in investing in radical innovation and, therefore, as the HT entrepreneurial venture matures and develops a customer base, the right leadership skills and innovation strategies are imperative for venture longevity.

Positing the consensus scholarly view that TFL stimulates organizational innovation, Ashraf and Khan (2013) examined leadership effectiveness of creating an innovative stimulating environment on organizational innovation in a quantitative study of three cellular companies and 164 employees in Pakistan. In the study Ashraf and Khan (2013) found that innovation propensity of leadership, analogous to technology orientation of CEOs (Chen et al., 2014), is an important antecedent to team innovation, and is the most significant predictor of the effectiveness of an organization. However, Fu, Li, and Si (2013) found, using a quantitative method to test the hypotheses on positive innovation effect of TFL in 159 Chinese HT companies, that TFL may not be optimal for enterprises in the Eastern cultures. The conclusions of Shafie et al. (2014) supported the findings of Fu et al. in a study conducted in Japan. Fu et al. reasoned that the results were different because of the differences in management situations and styles in Eastern cultures. Paternalistic leadership, which is a combination of authoritarianism and benevolence, was more suitable for explorative (innovation ideas) and exploitative (developing innovative products) for Eastern cultures (Fu et al., 2013). Innovation and NPD are long term dynamic and evolving

processes requiring multiple and ongoing longitudinal design research to assess the leadership dynamics of innovation and implementation across all the major innovating countries.

Comparing the effects and constructs of TFL and servant leadership (SL) in the context of creating organization value, Choudhary, Akhtar, and Zaheer (2013) used a quantitative method survey design of 155 participants from Pakistan's service sector industries. Their study showed that TFL favorably compared with SL in promoting organizational learning and innovation, and improving employee job performance, thus enhancing overall organization performance. Choudhary et al. concluded that SL was an extreme case of leadership in which the primary focus of the leaders is on serving followers and customers and potentially to the detriment of the organization. This Pakistan based study provides another window on the effectiveness of TFL in the service industry supporting comparable findings by Wang et al. (2014) in Taiwan and Kao et al. (2015) in China in studies on different segments of the service industries.

Slavik et al. (2015) performed a comparative analysis of state-of-the-art theories on leadership including TFL, SL, and spiritual leadership, and followed up with a retrospective case study to create a successful leadership model. The focus of the study was on effective corporate strategic management. Slavik et al. found visibility, ethical behavior, integrity, transparency, confronting challenges, planning and sharing, and result orientation as fundamental strategic leadership attributes. There is no consensus on the ideal leadership model inferred Slavik et al. but recommended important concepts from servant and spiritual leaderships could make TFL more robust.

A repertoire of TFL skills exhibited by the leadership can synergistically complement the high levels of the team's task-oriented and relationship-oriented personalities, advocated Zhou, Hu, and Zey (2015). Entrepreneurial CEOs with an innovation-oriented attitude and TFL skills can drive NPD through the stimulation of organizational learning and innovation culture (Sattayaraksa

& Boon-itt, 2016). NPD team's TFL has a positive correlation and team climate mediates the relationship between most dimensions of NPD team's TFL and team performance (Sun, Xu, & Shang, 2014). These characteristics are conducive and essential to collaborative work in innovation and NPD, and necessary to the sustainability of HT entrepreneurial ventures. The fast moving and creative destruction nature of the HT industry makes such leadership skills and concomitant innovation minded and people oriented personality of the leader mandatory in creating a motivational and open organizational environment for sustained team synergy. TFL constructs embed primary characteristics of generating team spirit, engendering creativity and innovation, and imbuing a *can-do* attitude, which is vital for HT venture sustainability. Analysis and discussion of the literature on other leadership models follow. I summarize the literature review about leadership with comments on the viability and value of TFL as the basis of the conceptual framework for application to the business problem of entrepreneurial HT venture sustainability.

Literature of the Theme of Project Leadership for Venture Sustainability

Laufer (2012) and Shenhar (2015) underscored the strategic importance of project management in the contemporary business environment because the efficiency and efficacy of NPD project execution converts an innovation into a commercial product, which affects entrepreneurial venture sustainability. Shenhar defined strategic project leadership (SPL) as a comprehensive, research-based, industry-proven approach to project management incorporating the strategic and business-related aspects of projects adapted to the type of innovation and context. Shenhar emphasized the importance of SPL in managing the uncertain, complex, non-linear, and continuously changing project environment of 21st century business in conjunction with time, budget, and performance for successful NPD. The primary objective of SPL is to inspire project managers to become project business leaders advocated Shenhar.

Laufer (2012) and Rolstadås, Tommelein, Schiefloe, and Ballard (2014), supported Shenhar (2015) in asserting that SPL requires creative or divergent thinking for novel ideas and solution because of the dynamic circumstances, high risk of radical innovation conversion to NPD, and limited or non-existent market information creating high levels of uncertainty. In a retrospective analysis of eight complex projects, Laufer deduced nine project leadership practices for delivering extraordinary results. The practices are embracing uncertainty, adapting contextually, challenging the status quo, recruiting the right team, shaping the right culture, planning and anticipating, face-to-face communication, goal and results orientation, and leading first to manage smartly. Rolstadås et al. identified two approaches to project management, prescriptive and adaptive. Based on a study of three case projects, Rolstadås et al. developed a model integrating organizational structure, technologies, culture, social relations and networks, and interactions for effective project management. Rolstadås et al. concluded that there is no single recipe for project management success because of external competition and industry type, and internal organization dynamics and the variabilities of organizations and projects.

Shared or team leadership is a top-five ranked emerging theory (Dinh et al., 2014). Fausing, Joensson, Lewandowski, and Bligh (2015) conceptualized team or shared leadership based on existing shared leadership literature on *soft* or high uncertainty projects. Shared leadership can create efficiency toward goal achievement because the ambiguity and complexity of most innovation based NPD projects needs multiple expertise theorized Fausing et al. Externally empowered contextual leadership behaviors can positively contribute to project conditions of interdependence, creativity, and complexity (Fausing et al., 2015). Hoch and Kozlowski (2014) found improved team performance with strengthened relations and project success in shared team leadership environment regardless of the degree of team virtuality. Hoch and Kozlowski studied the phenomenon by using a quantitative method and collected data from a field sample of 101

R&D teams consisting of 565 members from global manufacturing industries. The findings indicated that shared and vertical leaderships positively correlated with project teams' innovative behavior and transformational and empowering leadership styles were antecedents of shared leadership.

Shin, Shin, Yoo, Song, and Kim (2015) advocated strategic delegation to or shared leadership by R&D and marketing managers, which is a case of horizontal coordination, because of a higher potential for new product profitability. Shin et al. applied a game-theoretic modeling approach to examine strategic delegation where peer managers had conflicting incentives. The study showed that strategic delegation might produce a better financial outcome with Nash equilibrium than perfect coordination of managers' decision by a profit-maximizing CEO. Shin et al. provided feasible insight to achieve Nash equilibrium to satisfy the conflicting incentives of entrepreneurial venture's stakeholders thereby boosting venture sustainability. Hoegl and Muethel (2016) used the perspective of myopia of leaders to the potential of shared leadership of their teams and developed strategies for enabling realization the potential of shared leadership. Hoegl and Muethel studied the influence of such strategies in leaders working with self-reliant teams, respecting competencies of members, and being a team member, and affirmed the value of shared team-based leadership.

Product development of innovation is a complex, cognitive, interdependent, and knowledge-based process requiring a variety of leadership skills at multiple levels. Literature review of different studies from varied perspectives and research approaches on project leadership strongly indicates that skilled leadership at all levels is indispensable for project success. Strategic and shared project leadership behaviors effectively motivate team members evoking collaborative contribution from multiple knowledge resources. Such leadership behaviors are essentially TFL attributes of individualized consideration, shared vision, innovation stimulation, collaborative

performance, and goal orientation. These project leadership behaviors combined with strategic, team, and shared styles for innovation and NPD are of significant importance in HT entrepreneurship venture sustainability.

Literature of the Theme of Systems Leadership for Innovation

Johannessen and Skålsvik (2013) conceptualized innovation as systems leadership for the knowledge economy and developed a holistic integrated model including entrepreneurial action, innovative leadership, organizational creative energy fields, HT wealth creation, and innovation as an integrated business process. The study methodology was conceptual research with the discussion of an analytical model comprising balanced leadership and administration promoting creativity, innovation, productivity, and change. Innovation leadership concept is similar to the systems model of leadership because all aspects of the organization's business are in flux. Such a systems model of leadership, synthesizing wisdom, intelligence, and creativity, is most productive in engendering innovative ideas, analytics in assessment, and practical intelligence in implementation claimed Johannessen and Skålsvik. McKinney (2012) embedded the systems leadership concept in a method outlining focus, ideation, ranking, and execution (FIRE) to develop high-quality, innovative products with significant commercialization potential. McKinney suggested leaders asking *killer questions* of the knowledge workers to elicit unique and radical innovative ideas and implementation processes to maintain a competitive edge. In the knowledge economy, system leaders should create a customer-centric organization culture (Johannessen & Skålsvik. 2013; McKinney, 2012).

Zacher and Rosing (2015) empirically tested the ambidexterity theory of systems leadership conceptualized in 2011. The central idea of ambidextrous leadership is that team innovation is highest and superior to TFL when complementary behaviors of innovative ideas (explorative) and product development (exploitative) are high (Zacher & Rosing, 2015). In these authors'

quantitative method study the survey design data came from 33 team leaders and 90 subordinate employees of architectural and interior design firms. The findings affirmed the ambidexterity leadership proposition, but the small sample size and cross-sectional design and lack of a control group are significant limitations of the study. In a larger context, however, I suggest the ambidexterity leadership model an aspect of the systems model of leadership.

Literature of the Theme of Servant and Paternalistic Leadership Skills for Venture Sustainability

Choudhary et al. (2013) and Fu et al. (2013), respectively, described the servant and paternalistic leadership models. Choudhary et al. broadly conceptualized SL in a leader with a primary focus to motivate, guide, and provide a caring experience by establishing a quality relationship focus with the followers and customers. The two main constructs of the servant leader are ethical behavior and concern for subordinates, Choudhary et al. explained. As discussed earlier, a comparative review of TFL and SL by Choudhary et al. showed that TFL is superior to SL for organization learning and performance, which portend venture operational longevity. Fu et al. construed paternalistic leadership as a combination of benevolence and authoritarianism and found that benevolent leadership had a positive effect on the exploitation process or implementation of innovation. Authoritarian leadership contributed to the explorative or ideation process. Fu et al. investigated the impact of paternalistic leadership on innovation and implementation using a sample of 159 Chinese HT companies.

Literature of the Theme of Entrepreneurial Phenomenon for Venture Sustainability

Schumpeter in 1934 defined the entrepreneur as an agent of change and associated innovation with entrepreneurship in a combination that triggers creative destruction (Shafie et al., 2014; Stauffer, 2016). The entrepreneur introduces a new good or a new method of production, opens a new market or discovers a new source of supply, or starts a new organization of an

industry upsetting and disturbing existing methodologies explained Schumpeter (King & Baatartogtokh, 2015). Kirzner in 1973 conceptualized entrepreneurial initiative and alertness in seeking and discovering opportunities for a central role of entrepreneurship (De Jong & Marsili, 2015). De Jong and Marsili suggested that the combination of opportunity recognition through innovation (Schumpeterian) and alertness initiative (Kirznerian) define the role of the entrepreneur in the process of market competition. Campos (2016) inserted creativity as an intermediate variable modulating the relationship between entrepreneurial passion and entrepreneurial alertness. Using a quantitative examination, Campos tested hypotheses based on a survey of 244 experienced entrepreneurs. The findings of Campos showed strong relationships between creativity and passion, and creativity and alertness; however, Campos found creativity mediating the relationship between entrepreneurial passion and alertness.

Passion, innovation (creativity), and initiative, are the primary drivers of entrepreneurship aligned with the fundamental underpinning of the HT industry making the innovative and opportunistic HT entrepreneur the focal point of industry advancement. The leadership skills of the HT entrepreneur in creation of a sustainable HT venture are of critical import. In research of the entrepreneur and the entrepreneurship process, King and Baatartogtokh (2015), Parker (2018), and Tsvetkova, Thill, and Strumsky (2014) as well as other scholars concluded that the requirements of multiple business skills, experience, and character, characteristics, and entrepreneurship orientation of HT entrepreneurs to manage venture sustainability posed complex challenges for the HT entrepreneur.

An entrepreneur's personal attribute of innovativeness has a robust relationship in value creation of an entrepreneurial business (Stauffer, 2016). The background of the study by Stauffer was external validation for the novelty theory of innovation and the innovator mindset as an instrument of measure of personal innovativeness. Stauffer used a quantitative method and

collected data from 300 entrepreneurs on their ventures' performance for assessment of the innovator mindset. The results of the retrospective study indicated the importance of the entrepreneur's innovativeness as a predictor of business sustainability. A longitudinal follow-up study with a control group could provide more clarity to the findings.

Innovation focused entrepreneurs create business turmoil and drive incumbent organization leaders to adapt and reinvent or potentially go out of business inferred Tsvetkova et al. (2014) from an empirical research study on entrepreneurial HT venture survivability. The context of the study was regional competition and firm size. For the study, Tsvetkova et al. used data from the U.S. computer and electronic product manufacturing industry from 1992-2008. The longitudinal study findings indicated that innovation requires a constant focus, because if the entrepreneurial leader settles into running the business in a conventional way then the venture may lose the entrepreneurial character and potentially fail against new competitors, Tsvetkova et al. explained. In analysis of the high failure rates of incumbents in the semiconductor disk drive industry during the 1990s, Christensen et al. (2016) found that competent incumbent managers responded effectively to their customers by creating new and distinctive existing products on an incremental trajectory of innovation. Christensen et al. discovered that in so doing, the incumbent managers ignored the new disruptive innovation products produced by entrepreneurial competitors for new markets, which eventually encroached on the incumbents' business potentially resulting in their downfall.

The entrepreneur must continue to innovate for sustainability of venture with a framework of three leadership practices proposed by Slater, Mohr, and Sengupta (2014) of implementing an integrated approach, creating multiple partnerships, and possessing visionary leadership. Such a framework could circumvent operating venture failure because of active engagement with the wider dynamic context in which the company operates, and spanning boundaries beyond existing

products suggested Slater et al. The entrepreneur is a technology and business change agent as Schumpeter described, and in the technologically driven and fast-changing contemporary era of the 21st century, the leadership skilled HT entrepreneur can be a significantly effective change agent and venture sustainability leader.

Literature of the Theme of HT Entrepreneurial Leadership Characteristics and Skills for Venture Sustainability

Entrepreneurial leadership is the leadership style and behavior that significantly stimulates and fosters innovation (Schumpeterian) and opportunity recognition (Kirznerian) in highly challenging, turbulent and competitive environments (Bagheri, 2017). Leaders in dynamic and complex environments such as HT ventures need new idea generation and opportunity recognition as an effective means to improve the performance, growth, and competitiveness of their business (Bagheri, 2017). In a quantitative study of 310 employees from 39 HT small and medium sized enterprises in Iran, Bagheri found significant influence of entrepreneurial leadership on innovation work behavior and opportunity recognition of employees. In dynamic, hyper-competitive environments such as the HT industry, entrepreneurial leadership behaviors enable an entrepreneur to adapt organizational structures and processes rapidly in addressing numerous paradoxes and tensions (Leitch & Volery, 2017). The entrepreneurial leadership framework though, is evolving, with scholarly debate on the definition, constructs, and characteristics (Bagheri, 2017; Leitch & Volery, 2017).

The HT entrepreneur needs to demonstrate a comprehensive combination of leadership skills to guide their innovative entrepreneurial venture into a sustainable operating entity during the first 5 years of operations. Entrepreneurial orientation (EO), in its three dimensions of innovativeness, proactiveness, and risk-taking, was an important entrepreneurial characteristic in new venture sustainability in the research findings of Kam-Sing Wong (2014) and Wang,

Thornhill, and De Castro (2017). Kam-Sing Wong examined the impact of environmental turbulence on the three EO constructs by analyzing data from 244 China-based electronics manufacturers and found that skilfully managing environmental unpredictability can boost EO behaviors and NPD success. Wang et al. (2017) surveyed 846 emerging venture companies from Canada and deduced that EO in conjunction with venture legitimacy comprised of team, regulatory approvals, and social values, improves venture performance. In both studies, the researchers found positive mediating influences of EO constructs for venture sustainability: Environmental unpredictability on EO behaviors and NPD achievement potential by Kam-Sing Wong, and enhancement of new venture performance with integration of EO and venture legitimacy by Wang et al. (2017).

Ng et al. (2014) described the importance of an entrepreneur's intellectual capital based on an interdisciplinary literature review and proposed a conceptual framework describing the dynamic resource allocation of a taxonomy of heterogeneous intellectual capital optimally coordinated by the venture founder in the early stage of the venture for sustainability. Paswan (2014) asserted the value of the innovator's DNA as a strategic priority for CEOs and identified creativity as the highest leadership competency for company sustainability in a survey of 100 innovators and 1500 CEOs.

Leadership skills and strategies for innovation and business process management in conjunction with entrepreneurial passion of the HT entrepreneur are important for venture sustainability. LeLoarne and Maalaoui (2015), and Ravishankar (2016) termed these as *bricolage* strategies or perspectives. Business Process Modeling (BPM) for entrepreneurs after a radical or sustaining innovation was the subject of research by LeLoarne and Maalaoui who analyzed discourses of 40 French HT entrepreneurs engaged in radical innovation and 20 other entrepreneurs involved in sustaining innovation. The authors used theory as a grid for analyzing

the collected data and findings indicated that effective BPM after a radical innovation was iterative, requiring continuous adaptation or bricolage of multiple BPMs predicated on the nature of the innovation.

Ravishankar (2016) focused on innovation bricolage in emerging markets with a qualitative study of the only electric vehicle startup in India. The challenges of resource constraints of the innovator and the emerging market customer required multiple forms of bricolage the author found. The bricolage activities varied throughout the different stages of innovation and product development and needed complementarities between bricolage and engineering activities. In an empirical study using data from a sample of over 2400 early-stage venture entrepreneurs from Finland, starting businesses during 2005-2010, Stenholm and Renko (2016) found that passionate entrepreneurs were more likely to engage in bricolage behaviors to affect their ventures' sustainability. These geographically distant studies in different environments and from different perspectives point to the critical importance of adaptive and visionary leadership skills HT entrepreneurs need to adeptly manage the explorative and exploitative processes of radical innovation and positively affect venture sustainability.

The literature analysis indicates that the dynamics and challenges facing the HT entrepreneur for venture sustainability are significant. The evaluated entrepreneur leadership skills, features, qualities, and resources are important for the conception, development, and sustainability of an HT entrepreneurial venture. Comparison of TFL attributes and constructs with the features and characteristics of the different leadership frameworks shows the versatility and appropriateness of TFL as the conceptual framework because TFL includes the skills inherent in other popular leadership models. The characteristics of TFL embody the most complete, relevant, and necessary leadership skill set pertaining to entrepreneurial organization sustainability of an HT entrepreneurial venture. In Figure 1, I depict the encapsulation of skills needed by an HT

entrepreneurial venture leader. TFL conceptual framework encompasses the literature based desired entrepreneurship characteristics and leadership skills fundamental to the inception and longevity of an entrepreneurial HT venture.

I present the literature synthesis and analysis of three other study related phenomena of disruptive innovation, the learning and innovative organization, and venture finance. Chiaroni et al. (2016) and Christensen et al. (2016) evaluated disruptive innovation helping entrepreneurs boost venture sustainability by creating new products and markets. Popa and Vlasceanu (2014) suggested a learning organization environment conducive to creativity and innovation, aiding HT venture sustainability. Hoenig and Henkel (2015) and Wonglimpiyarat (2016) argued the significance of venture capital finance for HT venture sustainability in multiple contexts. The ensuing discussion provides insight and understanding of specific thematic leadership skills entrepreneurs need to promote venture sustainability.

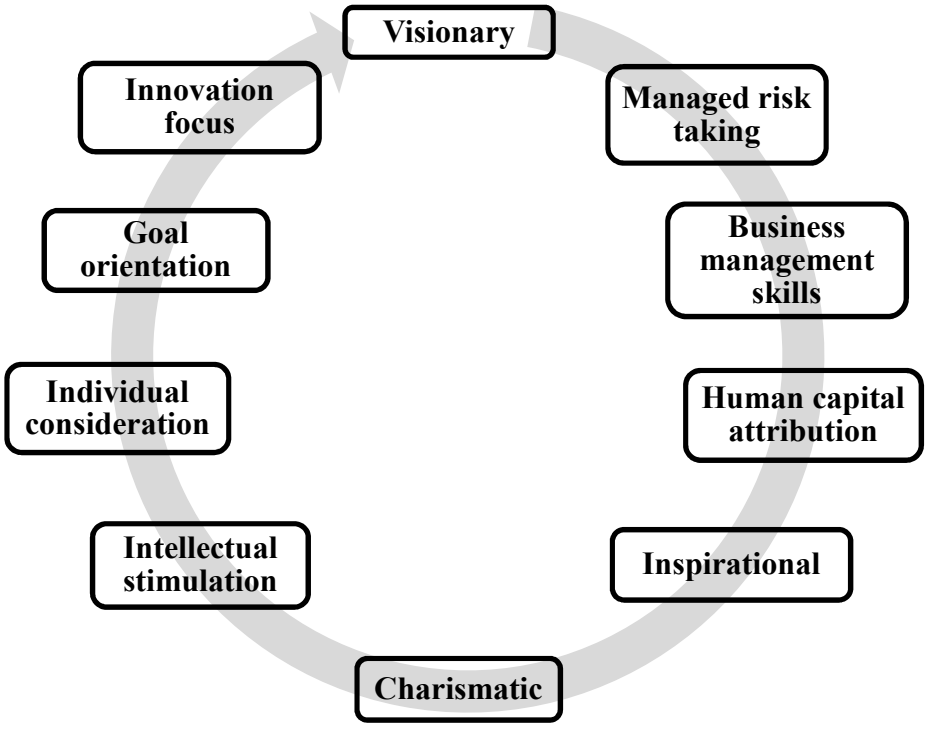


Figure 1. Interconnected transformational leadership skills needed by an HT entrepreneur for promoting venture sustainability (my representation).

Literature of the Theme of Leadership in Disruptive Innovation for Venture Sustainability

Abernathy and Clark (1985) analyzed the competitive implications of different types of innovation via the concept of *transilience* – the effect and implications of the type of innovation on management environments and established systems of production and marketing. Based on the analysis of the technical history of the U.S. auto industry, Abernathy and Clark categorized innovations into four types: niche creation, regular or incremental, architectural, and revolutionary or disruptive. In the niche creation phase, the technology exists, and the important management skill is finding new market opportunities, and in the regular mode, methodical planning and consistency of technological progress and engineering improvements are fundamental management issues. Architectural and disruptive innovations create new technologies requiring leadership management of creativity, insight into business risk, investments in new technology and processes in alignment with long-term corporate goals. Abernathy and Clark termed disruptive innovation (DI) as a process of creative destruction. HT entrepreneurs focus on an innovation *leap* in their ventures and need these requisite leadership skills to sustain their ventures in the first 5 years.

Christensen in 1997 analyzed and expanded the concept of DI with a specific focus on technological innovation and the entrant-incumbent dynamics in a comprehensive analysis of the semiconductor disk drive industry (Christensen et al., 2016; Sandström et al., 2014; Wan, Williamson, & Yin, 2015). Wan et al. detailed the potential of DI to destroy the value of existing technical competencies by the creation of new business modalities and markets. The features of DI products include cost effectivity and simplicity, a new business model, easy accessibility for usability, initial commercialization in emerging and new markets, structural cost advantages, and featuring different sources of value from mainstream products detailed Chiaroni et al. (2016), Christensen et al., and Wan et al. In contrast, the incumbents' leaders focus on sustaining innovation along the current customer valued dimensions, nominally are able and resourced to

respond to competitive DI products but remain resource focused on existing customer requirements, have organization level inertial constraints, and consequently struggle or suffer disrutpion Christensen et al. argued. Chiaroni et al. and Christensen et al. viewed DI entrepreneurs as disruptors or attackers roiling the business order and causing industrial turbulence by creating new markets and customers.

Sandström et al. (2014) disputed original assumptions of Christensen et al. (2016) in the theory of DI that incumbent organizations were heterogeneous with differing management preferences and the environment controlled the incumbents (resource dependency theory) as asymmetric and flawed. The incentive asymmetry between entrants and incumbents is a core element of the theory of DI Sandström et al. argued. Incumbent leadership can actively influence the environment and a symmetric analysis giving the same treatment to management of all entities making viable managerial decisions postulated Sandström et al. King and Baatartogtokh (2015) discovered that, despite the theory's widespread use and appeal, the theory lacked quantitative testing in the literature for its essential validity and generalizability. In discussions with technology industry experts for their study, King and Baatartogtokh found that incumbent company managers can and do respond effectively to potentially disruptive threats. King and Baatartogtokh, and Sandström et al. cautioned that the DI model provided a useful warning, but not a prediction, about managerial myopia, and that the conceptual framework of DI is applicable when structural economic changes happen or the existing incumbent innovation trajectory results in thin margin commoditized products.

Chiaroni et al. (2016) conducted a retrospective analysis of the global music industry and documented several examples of incumbents that succeeded in the face of DI threats because of dedicated strategic and organizational approaches. Based on the active response of incumbents, Chiaroni et al. developed a model suggesting managerial practices developed by incumbents over

time to respond to DI threats. King and Baatartogtokh (2015) suggested a diagnostic response to DI: incumbent managers should calculate the value of winning, find ways to leverage existing capabilities, and work collaboratively with other companies to respond to DI threats.

The lack of numerical support of the DI framework's validity was the result of the blunt measures used in statistical analysis (Christensen et al., 2016). More nuanced case analysis, Christensen contended, indicated that the DI concept appropriately described the failure of established companies in different industries and over time. The ability to respond to DI notwithstanding, if incumbent company leaders are not future-oriented or do not ask killer questions, build processes and structures to foster teamwork, and tolerate failure, the incumbents face marginality, or dissolution claimed Gemünden, Lehner, and Kock (2018) and McKinney (2012). A compelling example of DI roiling affected industries is the *sharing economy* (Zervas et al., 2017). Temporary renting of available personal assets and resources typified by a home or providing ride-hailing service in a personal car via online community marketplaces is negatively affecting incumbents in the hoteling, taxicab, and rental car industries Zervas et al. found. The efficiencies, competitiveness, and cost-effectivities offered to the population in the sharing economy portend radical business model changes for the incumbent companies concluded Zervas et al.

Corsi and Di Minin (2014) recommended including reverse innovation in the DI model to study companies in emerging economies as sources of new technological solutions. Corsi and Di Minin reviewed existing literature on innovation from the bottom of the pyramid (companies in emerging economies) and rationalized the concept of reverse innovation. The market of reverse innovation products was in emerging economies and Corsi and Di Minin reasoned that the influence of reverse innovation was similar to that of DI in advanced markets and had the potential to be in the DI model. Potentially, reverse innovation products could be competitive with

entrepreneur innovated DI products and affect HT venture sustainability.

Literature of the Theme of Venture Finance Phenomenon for Venture Sustainability

Venture capital (VC) is a high-risk and potentially high-return *equity* investment made by external investors to support entrepreneurial business creation and growth and is the cornerstone of entrepreneurial high-tech (HT) venture sustainability (Hoenig & Henkel, 2015; Wonglimpiyarat, 2016). An innovation based HT venture generally needs equity capital as *seed* capital at inception, which entrepreneurs may provide by bootstrapping or from angel investors, and additional rounds of substantial capital funding until the venture reaches stable positive cash flow state (Dibrova, 2015; Hellmann &Thiele, 2015; Moghaddam, Aidov, DuVal, & Azarpanah, 2017; Mollick, 2014). Hoenig and Henkel suggested assessment of high-tech start-up quality through patents, alliances, and team experience, which are important instances of observable resources. Types of VC financing includes business angel investment (Dibrova, 2015), private VC (Hoenig & Henkel, 2015), and corporate VC (Yang, Narayanan, & De Carolis, 2014). Government sponsored financing is another potential funding source for entrepreneurs evaluated by Wonglimpiyarat in the case of Israel and its government's Siliconia style of VC management based on the competitive Porter's Diamond or cluster model of VC financing.

Angel financing is entrepreneurial venture investments by wealthy individuals defined Carpentier and Suret (2014) and Hellmann and Thiele (2015). According to Dibrova, even though to an extent business angel financing is informal, it was a record 5.5 billion euros in 2013 and constituted 73% of early investment financing in Europe. Hellmann and Thiele found data from Crunchbase showing US angel financing grew annually at a 33% rate between 2007 and 2013, in a study quantitatively examining the relationship between angels and venture capitalists. Hellmann and Thiele further concluded angels and VCs tend to be *friends* initially and potentially become *foes* as the venture progresses because of diverging objectives and needs.

The purpose of corporate VC is strategic for exposure to new technologies and markets to enhance corporate value expansion (Yang et al., 2014; Anokhin, Wincent, & Oghazi, 2016). Corporate VC investment was $52.4 billion in 11,818 deals by 130 Fortune 500 corporations between 1995 and 2012 based on data retrieved from VentureXpert DB by Yang et al. The private VC investment during the same timeframe was $534.7 billion Yang et al. found. In a longitudinal 4-year study, from 1998 to 2001 of 163 corporations, Anokhin et al. concluded that in orchestrating and enabling investments, incumbent leaders positioned their corporation in the industry to take advantage of increased pools of innovative opportunities and improve scale efficiency yields.

Jia (2015) described three documented and challenging characteristics of HT entrepreneurial venture financing: a high degree of information asymmetry, high level of uncertainty about returns, and significant R&D investment prior to production. Jia developed a principal-agent theoretical model of start-up financing for HT ventures incorporating private information and hidden actions (information asymmetry and moral hazard) in which the equity investor can modulate the level of control predicated on the model's prediction of the probability of success. Jia found confirmation of the model in a review of real-world VC contracts and provided the mathematical proof of the validity of the suggested model. The reallocation of control rights contingent on venture performance portends benefits for the entrepreneurial leader for venture sustainability because such a contractual facility could make more financing available.

The field of entrepreneurial venture finance is rapidly evolving with the platform-mediated availability of crowdfunding aggregating many small investors to provide multiple levels of financing to entrepreneurs (Bruton et al., 2015; Frydrych, Bock, Kinder, & Koeck, 2014; Mollick, 2014). Bruton et al. suggested that technology advancements and regulatory changes have spurred new financial alternatives and increased the flow of entrepreneurial capital. The institutional setting formed the basis of the framework because it determined the financing alternatives of

microfinance, crowdfunding, and peer-to-peer lending Bruton et al. elucidated. Financing can come from different sources globally and entrepreneurs can select funding sources based on preferences, with ownership and governance established through a regulated platform.

Frydrych et al. (2014) and Mollick (2014) used retrospective databases of funded projects from crowdfunding platform Kickstarter to explain the underlying dynamics of success and failure of ventures in the virtual and impersonal crowdfunding process. Frydrych et al. used the Kickstarter database of 136,000 funded projects for an investment of $1 billion from 5.7 million investors and applied the funding impact variables of level of funding, founding team composition, and reward-level structure as a measure of project legitimacy. Frydrych et al. analyzed a representative sample of 421 projects and calculated the project success rate of 42.3%, and found smaller funding project amounts had a higher success rate. Mollick empirically evaluated data from 48,500 Kickstarter funded projects and found most entrepreneurs fulfilled their obligations to the funders but over 75% projects had delays although predictable by the level and amount of the project funding. Crowdfunding expands VC funding options for the HT venture, however, for the entrepreneurial leader, generating a signal for crowdfunding can be costly in time and resources but improves the potential of venture sustainability in the early years.

Literature of the Theme of Entrepreneurial Venture Sustainability

Literature provides multiple insights and analyses on the sustainability challenges of entrepreneurial HT ventures. In an empirical analysis from a longitudinal data from 1998 to 2007 of French HT firms less than 5 years old, Colombelli et al. (2016) found increased survivability of HT ventures when entrepreneurial leaders successfully engaged in product and process innovation or NPD. Process or product development innovation mitigated the high risk of solely product innovation Colombelli et al. analyzed. Leadership and innovative NPD driven HT ventures increased competitiveness and combined with human capital, venture capital (VC) funding, firm

heterogeneity, and knowledge spillovers enhanced venture sustainability in the initial years Colombelli et al. concluded. In a quantitative longitudinal correlational study from 2005 to 2014 of 131 European HT firms, Löfsten (2016) calculated a 46% 5-year survival rate of HT ventures. Löfsten identified two core business dimensions of business networks and entrepreneurial business behavior and competition as significantly contributing to HT venture survival. The latent variables, business and patent advice, and accounting and banking advice positively affected sustainability Löfsten found.

Sixty percent of the high rate of entrepreneurial venture failures within 5 years was a result of random error under certainty, but overconfidence was also a significant reason, in excess market-entry decisions (Artinger & Powell, 2016). For reduction of the significantly high entrepreneurial venture failure rates, potential entrepreneurs should focus more attention to the external realities of market competition rather than their own aspirations and abilities concluded Artinger and Powell. Examining a Swedish population database of 4,761 entrepreneurs who failed between 2000 and 2004, Baù, Sieger, Eddleston, and Chirico (2017) found that the age of failed entrepreneurs has a non-linear relationship with the likelihood of reentering entrepreneurship. The gender of failed entrepreneurs and multiple-owner experience in the failed firm were moderators of the findings Baù et al. concluded. Sarasvathy, Menon, and Kuechle (2013) posited a cause of high HT entrepreneurial venture failure rates was the agency relationship of some entrepreneurs in exploiting personal success at the cost of venture failure. Sarasvathy et al. postulated nine potential venture failure reasons: out of cash, lack of strategy, poor team, and innovation quality, changing market dynamics, stiff competition, lack of adaptive cognizance, product commercialization issues, and improper business guidance; therefore, astute leadership skills are necessary to allay such causes of failure and enhance HT venture sustainability.

Van Stel, Millán, and Román (2014) developed an HT entrepreneurial venture survival

model at a country level by analyzing its technological environment consisting of R&D expenditures, employment share of HT industry and knowledge-intensive sectors, and technology innovation patent filings. Data collection for the 8-year longitudinal study was employment data of HT entrepreneurial firms from 15 European Union countries. Using discrete choice models under competing risk frameworks, Van Stel et al. found strong support for a positive relationship between the technological environment indicators and the survival probability of entrepreneurial ventures in the country for a given year. The study has limitations because the lack of weighted indicator data at the organization level potentially skewed the actual results of venture survival. A thriving technology environment infrastructure is conducive to HT venture sustainability, and so the venture location is of importance in venture sustainability.

Research on risk management in early stage companies from multiple perspectives by Bowers and Khorakian (2014) and Kim and Vonortas (2014) revealed practical conclusions. Bowers and Khorakian evaluated innovation process risk in a project risk management theoretical framework and applied to five company case studies in the U.K. and Iran by interviewing 40 employees of the companies. The findings indicated the stage-gate framework was an effective interface for risk management with the suggestion risk management should be qualitative at innovation and quantitative at implementation. Too stringent risk management could stifle and discourage innovation cautioned Bowers and Khorakian. Kim and Vonortas empirically investigated aspects of risk management in 2 to 8-year-old companies in 10 European countries in 18 sectors. Findings showed HT innovation entrepreneurs in demanding volatile markets require intense networking formally and informally, and must use internal risk mitigation strategies more extensively. Leadership skills for judicious risk management are important for HT venture sustainability.

The findings in the literature regarding the causes of HT entrepreneurial venture failure

indicate the need for leadership skills for an array of challenges confronting venture sustainability; however, there seems to be a literature gap of research showing what and how contextual leadership skills entrepreneurs used to circumvent or alleviate such failure causes and sustained their HT ventures in the first 5 years of operations. In the study, I developed themes of leadership skills in the context of the leadership conceptual framework, which entrepreneurial leaders used to sustain their ventures at different stages in the first 5 years of operations of their entrepreneurial ventures.

Transition

In Section 1 of the study, I identified and discussed the problem and purpose statements, and presented justification for the qualitative study and a multiple case design in the nature of the study sub-section. In the significance of the study sub-section, I informed on the potential contribution to business and implications for social change viewed through the lens of the study. In the literature review, I demonstrated the effectiveness and applicability of leadership as the basis of the conceptual framework and the importance of DI and a learning and innovative organization in conjunction with equity finance for HT venture sustainability. Scholars suggested the Schumpeterian and Kirznerian HT entrepreneur profile and innovation form the fulcrum for venture sustainability coupled with effective NPD in an innovation organization environment with an EO mindset of the leadership and followers. The conflicting perspectives on the impact of DI on the entrant-incumbent dynamics notwithstanding, literature indicated DI importance for the competitiveness of both entities. The literature review on entrepreneurial HT venture sustainability highlighted the potential causes of venture failure. The appraisal of the literature review led to a conclusion of the need for research on the themes of leadership skills pertinent to HT venture sustainability.

In Section 2 of the study, the Project, I discuss the essential elements of the study: the purpose statement, the role of the researcher, study participants, research method and design, population and sampling, data collection and organization, data saturation, and analysis, and reliability and validity of the study. In Section 3 of the study, I present the research findings, application of the study to professional practice, and implications for social change. Section 3 and the study conclude with comments on the study limitations and suggestions for future research.

Section 2: The Project

I describe the implementation process of the study in Section 2. Beginning with a restatement of the purpose statement, I discuss my role as the researcher and the criteria for participant selection, research method, and design, as well as the sampling process for selecting the right participants. Data collection and analysis and reliability and validity criteria, and my approach and measures to satisfy the requirements conclude this section.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the leadership skills HT entrepreneurial leaders use to sustain their ventures during the first 5 years of operations. The targeted population was 11 entrepreneurial leaders located in SV, California, who possess leadership skills that have sustained their HT business during the first 5 years of operations. The implication of the study's findings on leadership skills includes the potential of increased HT venture longevity. The implications of enhanced venture sustainability for positive social change are job creation and economic growth contributing to the socioeconomic stability of individuals and their communities globally.

Role of the Researcher

I was the primary data collection instrument in the qualitative study. The researcher is the primary data collection instrument in qualitative research (Kemparaj & Chavan, 2013). With more than 30 years of work experience in the HT industry as a company employee and entrepreneur, I know about this study topic of leadership skills to sustain HT entrepreneurial ventures. My work experience was in engineering, and my executive positions in multiple companies and entrepreneurship experience spanned founding startups and angel investing in other HT ventures. Entrepreneurship experience in HT startups included sustainable and failed ventures. As an industry veteran, I knew some of the participants in the study.

The National Institutes of Health (NIH) (2014) showed three fundamental ethical principles: Respect of persons, beneficence, and justice, known as the Belmont Protocol, for a researcher to abide by in conducting research involving human subjects. In the qualitative study, I interviewed participants to collect data in compliance with the Belmont Protocol as follows. Each participant respectfully had privacy and confidentiality, as well as full autonomy to exercise judgment in providing data, and did not receive any compensation (NIH, 2014). The same interview protocol applied to all the participants, and their considered opinions garnered equal weight in data analysis (NIH, 2014). In adhering to the ethical principle of beneficence or obligation, no participant suffered any harm, exploitation, or negativity, or may benefit from the study (NIH, 2014). The ethical principle of justice was inherent in the process of fairness based on eligibility criteria in recruiting participants, uniform application of data collection protocol, and analyzing data from participant transcripts (NIH, 2014).

I was cognizant of personal bias because as a founder of HT ventures I had experienced success and failure of venture sustainability and maintained ensuing personal ideas on the topic. I avoided viewing data through a predefined position and focused only on data I collected. I was open and receptive to new and conflicting evidence from the analysis of the collected data and ensured the findings reflected only the collected data. Noble and Smith (2015) espoused meticulous record keeping showing transparent and consistent decision trails for data interpretation, complete and verified interview transcripts, and engaging with other researchers to reduce bias. Yin (2017) recommended the researcher's avoidance of a preconceived position, accounting for personal sensitivity to contrary evidence, awareness of personal capabilities, inclinations, and preferences, and circumventing viewing data through a personal lens. Bias reduction potentially enhances researcher's insights with reliance on collected data to reach a credible level of reflection in subsequent data analysis (Ritchie, Lewis, Nicholls, & Ormston,

2013). Using multiple data sources, collecting responses from participants in different hierarchical positions, from CEO to department director levels, of a company, and performing data triangulation by obtaining diverse viewpoints, I lessened personal bias and strengthened the credibility and confirmability of the study.

I used the interview protocol (see Appendix B) to conduct semistructured interviews and focus group discussion to gather data from multiple sources. The rationale for the interview protocol was to keep the same setting structure for the meeting but with flexibility of the meeting place and use the same procedural approach with all participants to improve the quality of collected information. Castillo-Montoya (2016) proposed a four-phase interview protocol which involved aligning interview questions with research questions, constructing an inquiry-based conversation, receiving feedback, and piloting the interview protocol to collect rich and detailed data. In qualitative research, the interview is a conversation with a purpose for developing knowledge to answer the research question (Ritchie et al., 2013). Researchers can generate new and deeper insights by collecting exhaustive data on participants' experiences through semistructured in-depth interviews focused on the research question (Cassell, 2015; Castillo-Montoya 2016; Ritchie et al., 2013). Thus, as the researcher and the primary collection instrument, I approached exploration of the phenomenon of the study using a high ethical standard and minimized bias with a sole focus on comprehensive data collected based on uniform interviews and focus group discussion protocol for all participants.

Participants

I sought entrepreneurial leaders as participants from HT ventures in SV, CA who had sustained their ventures beyond the first 5 years of operations. The participants had comparable academic and experiential backgrounds and a workable meeting schedule, spoke English, and could contribute knowledge on the overarching research question regarding the phenomenon of

leadership skills entrepreneurial leaders use to sustain their ventures in the early years. I had no supervisorial authority or any familial relationships with the participants. The selected participants understood and remained cognizant of informed consent (See Appendices E and F) relating to voluntary participation, withdrawal at any time, and potential risks and benefits of participation. The participation criteria in a study require employees of an organization who can answer questions related to the study phenomenon (Dasgupta, 2015). Antwi and Hamza (2015) suggested that building a partnership with study participants can lead to deeper insight into the phenomenon, adding richness and depth to the data. It is important that participants understand informed consent to participate in the study (Tam et al., 2015). The seniority and experience levels of participants in organizations of interest are important so as to collect contextually rich data related to the specified research objectives (Maramwidze-Merrison, 2016). Thus, the described eligibility criteria for study participants were appropriate, and the participant characteristics aligned with the overarching research question.

I used my personal industry network and LinkedIn to identify, contact, and recruit eligible participants at the leadership levels of two HT entrepreneurial companies. After explaining the purpose and potential benefits of the study to the participants and organization, I collaborated with the venture leader to identify qualified and willing participants in the company and made the leader the focal point of contact in the organization. Introduction by the designated leader to such participants and my invitation letter to each participant (see Appendices C and D) followed as applicable. Ritchie et al. (2013), and Wallace and Sheldon (2015) suggested researcher's sensitivity to the organizational hierarchy and keep a single point of contact, providing study objectives and requirements, responsiveness to concerns, flexiblility about timings and settings, and sharing findings through access to and effective engagement with participants to obtain quality information. Approaching known individuals in the company may help the researcher secure

participants easily, and such individuals may help the researcher more because of previously established rapport (Peticca-Harris, deGama, & Elias, 2016). An appropriate introduction letter by the researcher stating his or her flexibility in making the process easier for the participants will bolster the working relationship (Ritchie et al., 2013).

I individually contacted all participants in advance of interview and focus group sessions, explained the purpose of the study and the participant's role, answered participant questions and concerns to establish trust and mutual respect, and reached a comfort level for a working relationship. Each participant received my doctoral study overview (see Appendix I). Building rapport as well as trust, respect, and an honest agenda from the outset assisted in creating a rapport and working relationship. Socialization between the participant and researcher before actual interviews is helpful in reducing tension during interviews (Ashcraft & Ashcraft, 2014; Maramwidze-Merrison, 2016). Familiar participants might provide the researcher with a sense of company insider status in comfortably sharing their knowledge and experiences (Peticca-Harris et al., 2016). Cunliffe and Alcadipani (2016) characterized the participant-researcher relationship in qualitative research as a formal, neutral, and disengaged relationship requiring researcher reputation and rapport management. The quality of participants, my recuriting method, and rapport creation with participants benefitted the study.

Research Method and Design

Research Method

I used a qualitative method for my study. Qualitative researchers explore a phenomenon using open-ended interviews for an in-depth exploration of human knowledge through the articulation of participants' experiences to extract themes (Denzin & Lincoln, 2011; McCusker & Gunaydin, 2015; Park & Park, 2016). In contrast, quantitative researchers use closed-ended questions to examine variable relationships and differences through hypothesis testing (Campos,

2016; Park & Park, 2016; Yilmaz, 2013). Exploration of leadership skills requires an understanding of participants' experiences, and creating numerical interpretations of human behaviors may ignore critical issues that are not quantifiable; therefore, a quantitative method was not applicable. Mixed methodologists integrate both research methods in a single study (McCusker & Gunaydin, 2015). The quantitative component of a mixed methodology approach made it unsuitable for the study because the exploration of the study's phenomenon is not achievable in such a manner.

Park and Park (2016) described basic characteristics of qualitative and quantitative methods that provide clear distinctions of perspective, analysis, processes, and objective, between the two research methods. Qualitative method is subjective, unstructured, emergent, and contextualized, consists of an inductive and interpretive process in which the researcher interacts with the research giving it personal voice, and, therefore, has a high potential for bias (Park & Park, 2016; Yilmaz, 2013). In comparison, quantitative method is objective, structured, and generalizable, based on theory, and requires a deductive process using statistical analysis of numerical data in which the researcher is independent of the research and thus impartial (Park & Park, 2016; Yilmaz, 2013). In qualitative research, the focus of the researcher is on understanding the underlying motivations and reasons of a phenomenon using a small number of samples, semistructured techniques, and conducting a non-statistical analysis (Malterud, Siersma, & Guassora, 2016; Park & Park, 2016). Mixed-methods research provides an opportunity for the researcher to develop novel theoretical perspectives by combining the strengths of quantitative and qualitative methods to provide rich insights with an integrative set of findings from the two research strands (Venkatesh, Brown, & Sullivan, 2016). The analysis of the phenomenon of leadership skills is interpretive based on the exploration of the researcher, as viewed through the lenses of individuals who have used such skills and therefore, the qualitative method of research was appropriate for the study.

Research Design

I used the case study design for the study. The four main designs for qualitative research are (a) ethnographic, (b) phenomenological, (c) narrative, and (d) case study (Lewis, 2015). Ethnography is the systematic study of a particular group's cultural practices and behaviors (Compton-Lilly et al., 2015). Ethnography study design was inapplicable for the study because the study was on leadership skills for sustainability of high-tech (HT) entrepreneurial ventures in the initial 5 years of operations. In a phenomenological design, the researcher's concentration is on the meanings of individuals' lived experiences (Khan, 2014), which did not apply to the exploration of leadership skills entrepreneurial leaders use to sustain their venture in the first 5 years. Narrative researchers seek to describe the lives of individuals in biographies through interviews and participant observation (Compton-Lilly et al., 2015; Lewis, 2015). The exploration of leadership skills for HT entrepreneurial venture sustainability was not compatible with biographical description of individuals' lives and, therefore, did not apply to the study. A case study design indicates a flexible approach to the analysis of societal and developmental disciplines in which the researcher can collect information from individuals and groups (Yin, 2017). An appropriate qualitative research study design consists of a clearly defined purpose in which there exists coherence between the research questions, the method or approach, and the reliability and validity of generated data to answer the research questions (Ritchie et al., 2013).

In the study, I obtained consistency between answering the research question and method of collecting information from entrepreneurial leaders who used leadership skills to sustain their ventures in the initial 5 years of operations, which approach is consonant with a case study design. In contrast, the ethnographic design researcher focuses on gaining insights into everyday practices and behavior patterns of groups' cultures through interviews and observations (Brooks & Alam, 2015). In a phenomenological design, the concentration is about the meanings of individuals' lived

experiences contained within conversations and texts (Gee, Loewenthal, & Cayne, 2015; Khan, 2014; Ritchie et al., 2013). The narrative inquiry researcher seeks to understand and represent experiences through the stories that individuals live and tell (Compton-Lilly et al., 2015). Of the four research designs, therefore, the case study design was appropriate for my study.

The flexibility of a case study design approach enabled me to gather the relevant information on leadership skills from high-tech (HT) entrepreneurial leaders who used such skills to sustain their ventures in the first 5 years. Researchers employing case study design seek an in-depth understanding of complex phenomena by asking *what, how* and *why* research questions, identifying links, and creating themes to answer the research questions (Yin, 2017). Exploration of leadership skills is a broad and complex phenomenon requiring current data in a naturalistic context, which is eminently suitable for case study research because it enables a holistic, in-depth examination of a phenomenon necessitating its study within the context in which it occurs (Singh, 2015). For the study, therefore, the case study research design was appropriate to explore the leadership phenomenon via what and how inquiry.

To achieve data saturation, I used multiple data sources by interviewing appropriate participants at multiple hierarchical levels of companies in one-on-one and in focus group discussion settings. Performing member checking, and asking the same set of questions to each participant and in the focus group, my goal was to collect rich data. A researcher achieves data saturation when there are no new information, coding, or themes possible and findings are replicable (Fusch & Ness, 2015; Keutel, Michalik, & Richter, 2014). In data saturation strategizing, Elo et al. (2014), and Fusch and Ness (2015) emphasized the quality and appropriateness of the population sample for collecting in-depth data over the size of the sample. Another strategy for data saturation is member checking, also called member validation, which is the validation of the researcher's interpretation of the interview with the participant and provides

the maximum benefit for dependability and credibility of a qualitative study (Fusch & Ness, 2015; Harvey, 2015). Combination of multiple data sources, quality of sample, and member checking, therefore, indicates the approach used was appropriate to reach data saturation.

Collection of data, which is rich in quality and comprehensive in quantity, and well saturated, is critical for the trustworthiness of the study (Elo et al., 2014; Fusch & Ness, 2015). Rich data collection by the researcher from multiple sources portends layered, detailed, and nuanced information is important to reach data saturation recommended Fusch and Ness. In asking semistructured questions, Elo et al. cautioned not to steer the participant's answers toward obtaining inductive data and affecting data quality and saturation. Asking the same questions of multiple participants at different hierarchical levels of a company ensures getting diverse perspectives on the phenomenon and is a rigorous approach to reach data saturation (Dasgupta, 2015). The data saturation methodology was, therefore, compatible with the collection of rich and exhaustive non-inductive data.

Population and Sampling

On the basis of my knowledge and connections in the high-tech (HT) industry, I used a *purposeful* sampling method to select the participants of HT entrepreneurial leaders with demonstrated leadership skills used in sustaining their entrepreneurial ventures for the initial 5 years of operation. Participant selection requires a rationale and purpose in collecting the appropriate data aligned to the research question and based on the conceptual framework (Cleary, Horsfall, & Hayter, 2014). In purposive sampling, the researcher handpicks the participants based on their personal experience or knowledge of the topic under study and is the most commonly used sampling method for interview-based research (Cleary et al., 2014; Etikan, Musa, & Alkassim, 2016; Kemparaj & Chavan, 2013). Robinson (2014) recommended a 4-point interlinked sampling method of selecting a sample universe with inclusion criteria, a practical *and* ideal sample size, a

purposive sampling strategy, and sourcing the sample from the target population to achieve coherence for the intended research goals of the study. I applied this sampling process in selecting study participants.

The sample of eight participants for one-on-one interviews and a 3-member focus group discussion I selected from the leadership of two HT entrepreneurial venture companies had skills used to sustain their ventures in the first 5 years of operations. The importance of the adequacy of the sample is in collecting rich, dense, and focused information to provide a convincing account of the research phenomenon to answer the research question and ensure data saturation (Cleary et al., 2014; Fusch & Ness, 2015). The quality and appropriateness of the population sample for collecting in-depth data are of significant importance in answering the research question and for data saturation (Elo et al., 2014; Fusch & Ness, 2015). My selection of the number of participants for one-on-one interviews and focus group discussion enabled collecting in-depth data. Such skilled leadership participants from two HT entrepreneurial companies sourced collection of a cross-section of contextual, detailed, and varied perspectives of pertinent data on leadership skills to achieve data saturation in alignment with the research question.

I selected participants from two HT entrepreneurial ventures in SV, CA providing geographic homogeneity for the proposed idiographic multiple case study research. The foremost global trendsetting and flourishing HT entrepreneurship region is SV, CA (Gill & Larson, 2014; Robinson, 2014). SV, CA is a regional cluster and a cluster of innovation (COI) and the genesis of the term Siliconia. The sampling universe establishes a geographic boundary, and the location of the study signifies its salience to the subject of inquiry (Ritchie et al., 2013; Robinson, 2014). SV, CA, was a suitable region for recruiting study participants.

The participant eligibility criteria discussed was apposite for recruiting candidates from the HT venture organizations in SV, CA. The described academic qualifications and operational

experience of the eligible participants to contribute information about the leadership phenomenon for the study indicated that all participants were over 18 years of age. Participant recruitment was via a personal network of HT entrepreneurs, investors, and professionals in SV. I had no supervisorial, familial, or other authority over any participant. Sanjari, Bahramnezhad, Fomani, Shoghi, and Cheraghi (2014) emphasized the participant selection criteria to ensure that all participants can answer interview questions independently and in a manner, they deem appropriate. Such participants can provide highly relevant information to fulfill the aims of the study by contributing rich and focused information on the research question for the researcher to attain an in-depth understanding of the *how* and *why* of the phenomenon and data saturation (Cleary et al., 2014; Malterud et al., 2016). My criteria for participant selection, the selection process, and the number of participants were apropos for the study.

I arranged the setting of one-on-one interviews and focus group discussion in comfortable and private locations with uniform seating convenient for the participants where there was no interruption, and I conducted and recorded the interviews and focus group discussion in a confidential environment. Identifying private, accessible, and comfortable interview locations made the interview process and questions clear, respectful, and comfortable, and to conduct interviews confidentially with recording is of significant importance in collecting accurate data (Kidney & McDonald, 2014). Planning and flexibility for a participant are important considerations in the location selections and settings of the site, which will likely be productive for data collection (Kemparaj & Chavan, 2013). Uniform power balance in interview settings is conducive to open and candid discussion and information exchange (Ritchie et al., 2013). For data collection, the interview and focus group settings were a fitting environment appropriate for participants to provide information confidentially in relaxed and thought-provoking ambiance.

Ethical Research

I obtained agreement from each of the participants by their emailed "I consent" of the informed consent forms for interview or focus group discussion (see Appendices E & F), delineating the participant's understanding of the purpose of the study, the shielding of participant's anonymity and confidentiality, and autonomy in partaking, independence in answering questions, and protection from harm. Informed consent is an integral and critical aspect of ethical research for qualitative studies wherein the researcher specifies ahead of time the type of data to be collected and the use of the obtained data (Sanjari et al., 2014; Tam et al., 2015). The informed consent form should indicate that the participant understands the nature of the study, the voluntary nature of participation, the purpose and potential benefits of the study, and the maintenance of confidentiality (Tam et al., 2015). The informed consent forms for interviews and focus group discussion are in Appendices E and F respectively and listed in the Table of Contents (TOC).

Participation in this research was voluntary, and a participant could withdraw, without obligation, from the study at any time with the option to allow me the use of the information given previously (Øye, Sørensen, & Glasdam, 2016). Consent to participate was not absolute and did not need reassessment during data collection regarding participant anonymity and information confidentiality, and protection from harm for continued consent (Ritchie, 2013). Incentives for participation can increase the likelihood of participation but may provide motivation for fabricating information (Robinson, 2014). Incentives could be a consideration and or necessary to recruit participants in certain research areas particularly in the healthcare sector (Kidney & McDonald, 2014). For the study, no participant declined or withdrew and no participant received any incentive or compensation.

The mandated three basic and fundamental principles or general judgments of ethical research are respect for persons, beneficence, and justice established in the Belmont Protocol from the NIH (2014) and required by the IRB at Walden University. As the primary instrument of data collection, the researcher must ensure ethical behavior in the researcher-participant relationship by respecting the privacy of the informants, avoiding misrepresentations, and establishing candid and honest interactions (Sanjari et al., 2014). The researcher must clearly inform the participants on the use of the findings and preservation of anonymity of the participant and confidentiality of the obtained data (Ritchie et al., 2013). With no authority or control over the informants and abiding by the Belmont Protocol, I assured that no harm would come to the participants. Alphanumeric labels shielded the identity of participants and merger of collected data in the analysis without source attribution preserved the confidentiality of the data. The interview questions are in Appendix A, interview and focus group discussion protocol in Appendix B, invitations for the data collection settings are in Appendices C and D. Appendices E and F show the informed consent forms for interviews and focus group discussion respectively, and the cooperation letters of the participating companies are in Appendices H and G. The TOC contains links to all 10 Appendices in the study. This final doctoral study includes the WU IRB approval number shown in the Informed Consent forms in Appendices E and F, which identifies the data repository.

I used alphanumeric labeling to anonymize all data for the study and have securely stored the data for 5 years on a hard disk kept in a bank safe deposit locker and in a secure access database storage cloud to protect participant confidentiality. Dataset anonymizing before archiving and preserving the confidentiality of participants' information and comments by avoiding attribution in reports and presentations are important and ethically significant (Ritchie et al., 2013). Effective storage strategies include secure data storage with the removal of identifier components, biographical details and pseudonyms applicable to names of individuals, places, and organizations

(Sanjari et al., 2014). After 5 years, I will shred the data CD and delete the study data in the cloud storage.

Data Collection Instruments

I was the primary data collection instrument for the study and conducted semistructured interviews to collect data from participants in one-on-one interviews and focus group discussion settings. Data collection from participants in semistructured face-to-face interviews gives participants the flexibility to respond to questions freely and illustrate concepts for the researcher to collect a complete data (Dasgupta, 2015; Yin, 2017). Semistructured interview process enables obtaining all information allowing participants to illustrate concepts (Dasgupta, 2015). Elo et al. (2014) cautioned that in semistructured interview method, the researcher must be careful not to influence the answers of the participant toward collecting inductive data. Focus group discussions are strategic, enabling the researcher to focus on, and uncover underlying causes and path to solutions shaped by group interaction, stimulating thoughtful and creative thinking (Ritchie et al., 2013). Using a combination of semistructured interviews and focus group discussion I collected comprehensive and multi-perspective quality data from the participants for the study.

The interview and focus group discussion protocol in Appendix B shows how I functioned as the data collection instrument. I audio-recorded the meetings, transcribed the recordings, and documented my interpretations to maintain a complete record and audit trail of the data collection process. In qualitative research, the reliability of interview protocols can increase the quality of interview data (Castillo-Montoya, 2016). A 4-point framework for semistructured interviews of aligning the interview and research questions, developing an inquiry-based conversation, getting feedback on, and piloting the interview protocol can strengthen the reliability of the protocol and improve the quality of the obtained data recommended Castillo-Montoya.

I performed transcript verification and member checking with each of the participants as stated in the interview and discussion protocol (see Appendix B), which enhanced the reliability and validity of the data collection process. Member checking can confirm the researcher's interpretation of the collected interview information, lending credibility to the data analysis and enhancing academic rigor (Cope, 2014; Fusch & Ness, 2015; Houghton, Casey, Shaw, & Murphy, 2013). Appendix A has the interview questions, Appendix B the interview and discussion protocol, Appendices C and D the participant invitation letter, and Appendices E and F the informed consent forms and all Appendices have links in the TOC.

Data Collection Technique

In interviews or focus group discussions, the researcher describes the type of interview or discussion to the participants, records the proceedings in audio or video media, and transcribes interviews and discussions for participant verification (Ashcraft & Ashcraft, 2014; Cyr, 2016; Kemparaj & Chavan, 2013). One-on-one interview formats provide encouragement to the participant to talk in-depth about their perspectives on a research topic (Kemparaj & Chavan, 2013). Interviewing in qualitative research is a strong and flexible mechanism to create insight into the research postulated Kemparaj and Chavan. Semistructured audio-recorded interviews enable repeated reviews of the collected data for emerging themes and remaining true to participants (Noble & Smith, 2015). A disadvantage of the interview process is the researcher as the primary data collection instrument could lead participants in giving reflexive responses, impacting data quality, and introducing bias (Noble & Smith, 2015; Yin, 2017). I alleviated bias by performing audio transcript verification and receiving member checking approval from all participants.

Focus groups, not exceeding 12 members, enable the researcher to gain new insights into the research topic by guiding focus group interactive discussions in a conversational manner and collecting data from everyone based on the participants' range of experiences and perspectives

(Clow & James, 2014; Cyr, 2016). Focus group data collection arrangement can strengthen an interview-based study with recording and transcription (Olsen, 2014). Focus group discussions are strategic, with a researcher uncovering underlying causes and path to solutions shaped by group interaction, stimulating thoughtful and creative thinking (Ritchie et al., 2013). Focus groups are a superior way of assessing complex concepts and for a researcher to probe thoughts of individuals in a group setting (Clow & James, 2014). A disadvantage of focus groups is groupthink, which occurs through the informal leadership of one or a few individuals dissuading other group members from expressing different viewpoints in a group environment (Clow & James, 2014). Some individuals may be reluctant to articulate contrary opinions in a group, and the outcome may not be representative of all the members (Cyr, 2016). The selected focus group members were the highest ranking executives of each company who comfortably and assertively stated their opinions in a group setting.

I was the primary data collection instrument and conducted one-on-one in-depth semistructured interviews and a focus group discussion using the interview and discussion protocol (see Appendix B). After receiving the "I consent" on the informed consent form(s) and starting the audio recording on my cell phone, I asked the same interview questionsof the participants in one-on-one interviews and focus group discussion (see Appendix A)and noted in the study journal observations of non-verbal cues and participant behaviors. On occasion when needed, I paraphrased questions to provide clarity or details. The settings for the interviews and discussion group were in a private conference room at a table with comfortable and identical chairs and held in the company office building of the participant. I identified the audio-recordings with alphanumeric labeling.

I conducted face-to-face one-on-one interviews and focus group discussion in a conversational manner with the objective of collecting quality and detailed information on the

research question. Creating a rapport previously in introductory meetings with participants and providing them with my doctoral study overview (see Appendix I) facilitated the interview and group discussion process to take place in a relaxed environment, which encouraged the participant to share knowledge, insights, perspectives, and recommendations. Each interview lasted between 32 to 42 minutes. In the focus group discussion with three participants, with all of us seated around an elliptical conference table on identical chairs and facing each other, I asked all participants to respond to each question in a roundtable discussion format to get diverse perspectives and unique insights. The group participants stimulated the discussion by interacting and asking additional questions of the group based on their responses and my questions, which proved beneficial to the study. The focus group discussion took 53 minutes. There was one interview with each participant and one focus group discussion.

At the end of an interview or the focus group discussion session, I informed the participant(s) of sending via email the audio transcript within one week of the session and member checking file within one week thereafter for verification. I then verbally expressed my appreciation to the participant(s), turned off the recording on my Samsung S6 cellphone application (app), Smart Recorder, and left. I received participant responses in two to three weeks after sending out the emails as I committed to the participants. All participants approved the transcripts. One participant made edits in the member checking file. Using such an approach, I collected high quality and expansive quantity of multi-perspective and comprehensive data signaling credibility to the findings of the study.

I did not conduct a pilot study because of experience in the HT industry I knew what was suitable for the study. Transcript review and member checking strategies are important for data interpretation accuracy and analysis credibility, and for achieving data saturation (Cope, 2014; Fusch & Ness, 2015; Houghton, et al., 2013). I performed transcript verification and member

checking to validate the accuracy of data collection and interpretation and imparting credibility to the study.

Data Organization Technique

I uploaded the audio-recorded interview and focus group discussion files from my cellphone to my computer using a micro-Universal Serial Bus communications port (USB) to USB cable, transcribed the recordings in separate password encrypted Microsoft Word files, and securely stored the files on the computer's hard disk and in a personal account storage cloud. I applied automatic version updating and indexing and used the same alphanumeric Word file labeling system as the corresponding audio recording to maintain tracking consistency and identification efficiency, and protect the participant's identity and preserve information confidentiality. The alphanumeric file identification, BA21 BA54 for example, and labeling information is in a separate password encrypted file, and my computer login requires a password. Data interpretation (member checking) files of the transcribed data have a two-level read and edit password encryption with version updating and corresponding alphanumeric identification of the data transcript files. I used NVivo® software for data analysis, labeled the data tracking and emerging theme files with a different alphanumeric identification system, and have such identification in a separate file. The study journal in which I recorded observations of non-verbal cues and other elements during the interview and focus group settings, I keep in a locked cabinet in my home with the cabinet keys in a fire safe lockbox. I have securely stored all study related information on the two secure electronic media systems and study ledger in the file cabinet for 5 years. At the end of 5 years, I will shred the electronic media and study ledger in an electric shredder that I have in my home office. Next, I present literature analysis of the data organization and tracking systems.

Data storage of recordings and transcript media need a labeling system to disguise participant identity, and the identifying information must be stored separately from data (Ritchie, et al., 2013). I used an alphanumeric labeling system; an example is BA21 BA54, to anonymize the company and participant identities. Transcribing and coding the focus-group data using a computer is important because a 40-minute focus group discussion may need 30 to 45 pages of the double-spaced transcript (Olsen, 2014). Using identification codes for each speaker enables auto-coding for comments of each speaker suggested Olsen. Structured computer-assisted data management use by the researcher enables an efficient structure for version updating, and indexing, facilitating data organization, tracking, and searching (Ritchie et al., 2013). I used the file management and indexing features of Microsoft® 10 operating system to organize the study data with search and tracking functions. Data analysis software use by the researcher facilitates data management and tracking, cataloging, categorizing, and searching (Talanquer, 2014); therefore, the description of data organization techniques I used is copasetic with the literature.

Data Analysis

I performed methodological data triangulation by collecting data from two sources, one-on-one in-depth participant interviews, and focus group discussion. Initially, in data analysis, I read the individual interview and discussion transcripts, and segregated the data into specific codes of leadership skills in the context of the conceptual framework using word search feature in Word®. Then I transferred the information from Word to Microsoft Excel using the cut-and-paste feature in both apps, and reassembled data in Excel segmented into sequentially indexed codes based on word, phrase, or sentence matching and deduced emerging themes. I then combined the segmented and reassembled data with the interpreted thematic data used in member checking and did code refinement by collapsing, eliminating, or defining new codes. I now had a general understanding of the data and themes. I subsequently prepared the codes for insertion in data analysis software.

Triangulation in research is the use of more than one approach in data collection, which increases confidence in the findings and enhances academic rigor by augmenting credibility of the study (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014; Fusch & Ness, Houghton et al., 2013). Also, triangulation avoids potential bias issues arising from the use of a single data collection methodology and confirming data via the process of comparing data from multiple sources (Carter et al., 2014; Houghton et al., 2013). Methodological triangulation, which is the collection of data from multiple sources, is the most common type of triangulation and optimally suitable for case study research (Carter et al., 2014; Fusch & Ness, 2015). Data triangulation is an important aspect of enhancing the reliability of results, and the attainment of data saturation explained Fusch and Ness.

I used NVivo 11 student version Qualitative Data Analysis Software (QDAS) for coding and identifying themes. NVivo features of character coding, rich text, data, and idea management, ease of use, and output capabilities were the software qualities guiding my decision for selecting NVivo for data analysis. The reassembled and coded data in Excel file discussed above became the input into NVivo. Using the software simplified and accelerated thematic coding and categorization of data and gave accuracy to the process of counting, sorting, and displaying of gathered data from the participants. Qualitative research data is subjective and comprises text, images, diagrams, and audio, and tends to be lengthy requiring intensive and repeated analysis to answer the research question (Flick, 2014; Talanquer, 2014). The objective of qualitative data analysis is to deduce relationships between categories and themes of data to gain the understanding of the phenomenon indicated Flick. With the advent of QDAS or Computer-Assisted Qualitative Data Analysis Software (CAQDAS) about 25 years ago, the use of software for data analysis has become increasingly more prevalent (Flick, 2014; Talanquer, 2014; Zamawe, 2015). The use of QDAS offers many advantages of simplifying data management, showing dynamic and

simultaneous access to different components of data analysis, enabling the researcher to focus quickly and efficiently on themes and relationships emerging from the analysis elucidated Talanquer.

Using NVivo QDAS enabled me to manage data and rapidly discern the emerging central themes. I iterated data analysis by scrubbing data from NVivo outputs to hone in on the significant themes of the phenomenon of leadership in the conceptual framework. Several CAQDAS packages exist for qualitative data analysis; among these, ATLAS.ti, Dedoose, Leximancer, MAXQDA, and NVivo are the more common ones (Sotiriadou, Brouwers, & Le, 2014; Talanquer, 2014). Sotiriadou et al. cautioned on the lack of interoperability between the different QDAS packages requiring the researcher to make the package choice at the outset of the study. In comparing Leximancer and NVivo, Sotiriadou et al. found NVivo more popular but could not conclude which was more useful in optimizing research outcomes. Flick (2014) and Zamawe (2015) recommended NVivo because of its many advantages and potential of improving the quality of research. Flick cited the ease of analysis of five important tasks by using NVivo: data management, idea management, visual modeling, data query, and reporting. NVivo package features of character based coding, rich text capabilities, and multimedia functions are vital for qualitative data management concluded Zamawe.

I selected the words and phrases pertinent to the research question from the primary themes as search keywords to research for a correlation with the literature published through 2018 before final submission of the study for CAO approval. The literature search for the major and minor themes comprised the business and management databases accessed through the Walden library and in Google Scholar, which I searched in doing the literature review for the study. A literature search is a systematic exploration of the published literature to identify quality references on a specific topic (Grewal, Kataria, & Dhawan, 2016). A protocol-driven or systematic stepwise

electronic search of pertinent databases based on identifying keywords and grouping these in a string is an appropriate method of literature search explained Grewal et al. Online search of specific databases is the most effective and potentially essential in conceptualizing and conducting original research (Dawrs, 2016). Selection of the proper set of databases and methodical approach for conducting literature search is necessary for circumventing getting biased results and incorrect conclusions (Qiu & Wang, 2016). Therefore, the data analysis process, type of software, and extraction of the significant themes and correlation approach I presented has literature support.

Reliability and Validity

The framework for assessing rigor in qualitative research is dependability, credibility, transferability, and confirmability (Cope, 2014; Houghton et al., 2013; Kemparaj & Chavan, 2013). Cope, and Houghton et al., elucidated the different perspectives and methodologies in quantitative research and qualitative research and, therefore, the quality of study assessment criteria for the two research approaches are dissimilar. In quantitative research, the quality assessment emphasis is on reliability, validity, and objectivity and the analogous criteria in qualitative research are dependability, credibility, transferability, and confirmability (Cope, 2014; Houghton, 2013; Kemparaj & Chavan, 2013).

Reliability

I addressed dependability, equivalent to reliability, of the study by performing transcript verification and member checking of one-on-one participant interviews and focus group discussion, and stored the recorded sessions of interviews and discussion and personal notes of observations providing an audit trail. Dependability is akin to reliability in quantitative research and refers to the constancy and stability of data over time and across conditions (Cope, 2014; Houghton et al., 2013; Kemparaj & Chavan, 2013). The approach to determine rigor in dependability is strategies of audit trail, reflexivity, and stepwise replicability (Cope, 2014;

Houghton et al., 2013; Kemparaj & Chavan, 2013). Transcript verification and member checking contain all such features and can confirm the researcher's interpretation of the collected interview information, lending dependability to the data analysis and enhance academic rigor of the study (Cope, 2014; Fusch & Ness, 2015; Houghton et al., 2013).

Validity

I performed member checking of my interpretations of collected data to ensure the integrity of data understanding and enhance credibility of the study. Credibility in qualitative research is analogous to the internal validity criterion in quantitative research and reflects the researcher's interpretation and representation of participants' views (Cope, 2014). Member checking is the most compelling technique for establishing credibility argued Harvey (2015). Member checking by participants of interview transcripts and data interpretation underpins credibility (Fusch & Ness, 2015; Houghton et al., 2013; Kemparaj & Chavan, 2013).

I collected rich and detailed quantity of data for the study and described the settings of the data collection process, thereby satisfying the transferability criterion. The concept of transferability in qualitative research denotes data constancy in transference to other settings for similar conditions and connotes generalizability or external validity in quantitative research (Cope, 2014; Kemparaj & Chavan, 2013). Data, which is rich in quality and comprehensive in quantity, is critical for the trustworthiness of the study (Elo et al., 2014; Fusch & Ness, 2015). The strategy to achieve rigor in transferability is for the researcher to provide detailed descriptions highlighted Houghton et al. (2013), Kemparaj, and Chavan. Detailed descriptions of the research setting and transactions, including the research context and examples of raw data, enable the reader to consider their personal interpretation, explained Houghton et al., and Kemparaj and Chavan. The researcher satisfies the criterion of transferability if readers can associate the study findings with their experiences expounded Cope.

I created an audit trail of the collected data to provide transparency and impartiality enhancing the confirmability of the study. Confirmability provides assurance of the researcher's ability to demonstrate that the data represent the participants' responses and not the researcher's biases or viewpoints (Cope, 2014; Houghton et al., 2013). Kemparaj and Chavan (2013) defined confirmability as the neutrality or objectivity of the data indicating congruence between independent researchers about the accuracy, relevance, or meaning of the data. A strategy of maintaining a meticulous audit trail, which is an organized collection of documentation and decision-making by the researcher so that an independent auditor could arrive at the same conclusion attests to the confirmability of a qualitative study (Cope, 2014; Kemparaj & Chavan, 2013; Noble & Smith, 2015).

To achieve data saturation, I recruited a high-quality participant sample consisting of different hierarchical levels from two companies, conducted in-depth interviews and focus group discussion, and performed member checking and data triangulation. There exists a linkage between data saturation and data triangulation explained Fusch and Ness (2015). Data saturation happens when additional knowledge in data collection becomes negligible (Keutel et al., 2014). For achieving data saturation, the quality and appropriateness of the sample for collecting in-depth data are superior to the size of the sample (Elo et al., 2014; Fusch & Ness, 2015).

Transition and Summary

In Section 2, I provided a detailed insight into the study design by reiterating the focus of the project and the associated details of the study plan. Comprehensive information on the research method and design, population sample, data collection and organization processes, and data analysis served as a foundation to support and boost reliability and validity. Section 3 includes interview and focus group data and software analysis, with interpretations, analysis, and presentation of significant themes. I relate the findings to the conceptual framework and current

literature providing the (a) study conclusions, (b) application to professional practice, (c) implications for social change, and (d) personal recommendations to conclude the study.

Section 3: Application to Professional Practice and Implications for Change

The objective of this qualitative multiple case study was to explore the leadership skills HT entrepreneurial leaders used to sustain their ventures during the first 5 years of operations. The findings from analysis of the collected data using NVivo software showed 11 themes. The 11 themes consisted of six major themes and five minor themes. The six major themes were right team, innovation stimulation, adaptability, market orientation, open culture, and trust environment and execution. The five minor themes were leadership learning and development, technical ability, vision, finance, and leadership mentoring.

Presentation of Findings

I used NVivo data analysis software to code the theme nodes from the collected data in participant interviews and focus group discussions. I initially developed a set of preliminary themes associated with the findings for each question by using find and data sort features in Word and Excel applications, respectively. I then created the first set of nodes in NVivo using these themes. Using the text query feature in NVivo, I further developed, extended, and analyzed the theme nodes. NVivo's charting feature as well as explore and comparison diagrams visually depicting the theme distributions among the participants helped gain insights. Such techniques enabled me to arrive at the major and minor themes and association of themes with the findings.

Themes and Findings

The overarching research question for the study was: What leadership skills do HT entrepreneurs use to sustain their ventures during the first 5 years of operations? I collected data from participants working in two HT entrepreneurial venture companies in SV, CA through one-on-one interviews and focus group discussions. I asked the same questions (see Appendix A), of all participants in both data collection settings. Using NVivo software to analyze the collected data, I

extracted 11 themes regarding leadership skills necessary to sustain an entrepreneurial HT venture in the first 5 years of operations, depicted in Figure 2.

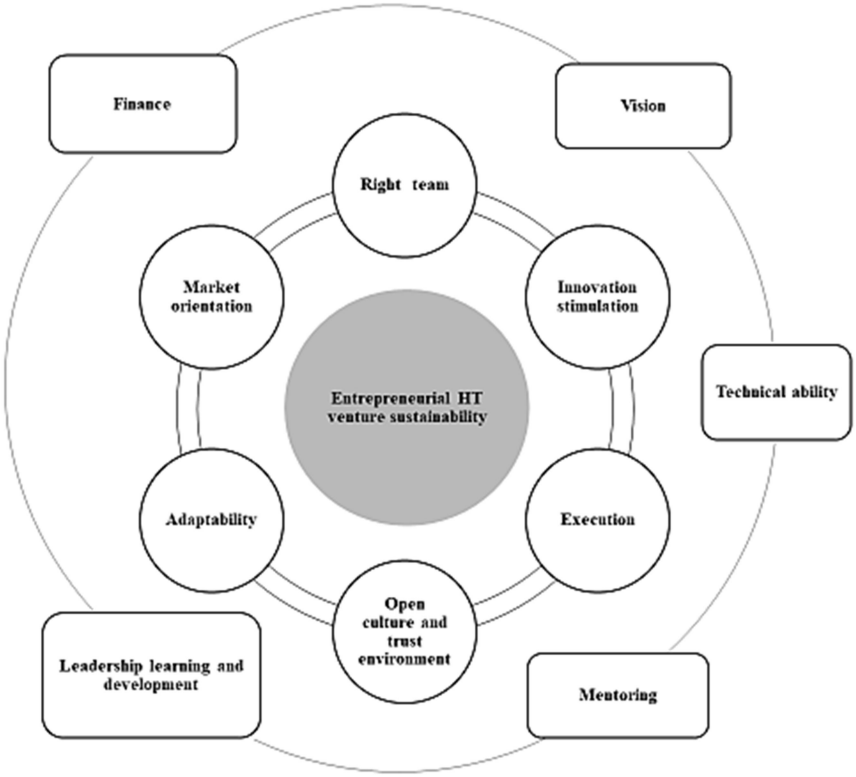


Figure 2. Major and minor themes of leadership skills for HT venture sustainability.

Data analysis indicated six major and five minor themes. As shown in the inner circle in Figure 2, the major themes of leadership skills are right team, innovation stimulation, adaptability, market orientation, open culture and trust environment, and execution. Leadership learning and development, technical ability, vision, finance, and leadership mentoring comprise the five minor themes, displayed in the outer circle in Figure 2. The themes align with the TFL constructs discussed in the conceptual framework section. I categorized the major and minor themes from the standpoint of participant responses regarding the focused leadership skill questions of types of leadership skills, the important ones, and the most effective skill. The major themes had concurrent responses from all participants in both data collection settings.

Both case study HT companies are more than 10 years old, and the founding entrepreneurs and most of the initial teams are still with their respective companies. One company trades in the public stock market while the other company is private. Therefore, the themes from the data I gathered from the participants portend practical business value in the findings of the study. The questions to the participants were regarding the definitions of pertinent and required leadership skills for venture sustainability, barriers in applying such skills and resolutions thereof, and the need for sustained learning and application of leadership by the leader. Accordingly, I discuss the themes in the context of findings in three segments.

Themes of the Findings of Leadership Skills

Data analysis focusing on the three leadership skill questions regarding definition of skills, their importance, and the most effective skill revealed the findings. The participants defined 11 leadership skills which entrepreneurs need to improve the sustainability of their HT entrepreneurial ventures. The six major skill themes become the foundation of HT venture sustainability in the first 5 years. Recruiting the right team with complementary expertise, teamwork attributes, commitment, and creativity establishes the high-performance dynamic resource of human capital. With technical ability and articulated vision, the leader can attract competent people, according to all participants. The right team thrives in an open culture and trust environment (See Appendix J) based on the leader's understanding of respect, integrity, and human intelligence for the *humanistic* aspects of people's behaviors. Such an environment is conducive to superior team commitment and productivity for expeditious and quality execution of operational tasks and activities, thereby greatly enhancing the potential to achieve shared goals. The concomitant themes of strong market orientation (MO) and rapid adaptability (see Appendix J) applied to the fast-changing dynamics of the HT industry can lead to marketplace positional advantages through innovation, product and marketing differentiation, and low cost.

The five minor themes form the building blocks of the HT venture support structure built on the foundation of major themes. The leadership skill themes of technical ability and vision are important in recruiting team talent in the required competencies. The leader and team, with technical competencies, an innovation mindset, and a market-oriented focus can maintain a competitive edge for the company, contributing to its sustainability. Participant AA21 AA53 stated, “In HT companies, there is no separation of technical and administrative management.” At the inception of an HT venture, entrepreneurs use bootstrapping (the first source of funds for entrepreneurial firms) to support the company financially. A detailed financial plan is necessary for raising sufficient financial capital from equity stakeholders such as angel investors and private and corporate VCs to innovate, develop, and market company products and create an IP portfolio. Sustained leadership learning and development supported with mentoring and coaching can help support honing existing and learning new leadership skills for navigating the dynamic business and social environment of the contemporary and increasingly technological society.

The primary leadership skill findings were these six major themes: right team, innovation stimulation, adaptability, MO, open team culture, and execution. All participants concurred with the requirement of these leadership skills, and the NVivo analysis showed a combined 72% of participant responses for the core theme nodes. Therefore, these core themes of leadership skills are critical for enhancing the sustainability of the HT entrepreneurial ventures in the initial 5 years.

The theme finding of the most effective leadership skill for HT venture sustainability is building the right team. The right team with the attributes of competency, complementary of discipline expertise, and collaborative teamwork is the springboard for the entrepreneurial leader to execute the company’s vision with innovative, market-leading, and customer desired products, in an open team culture environment with support resources. It is logical that the ‘right team’ is the most significant factor because the leader and team working seamlessly together can overcome the

challenges of limited resources and tight product schedules, and setbacks in getting funding in the fast-changing, highly innovative, and rapid product obsoleting HT industry. The theme of the right team received 21% of all theme responses from the content of the transcripts in NVivo analysis.

> A focus group participant stated the leadership skills needed for HT venture sustainability: Leadership skills required for sustainability are in people interactions and respect for people, creating a culture of trust and confidence and an open environment for the team to discuss issues, with an understanding of the technical details of the company's product, demonstrating integrity, and promoting a sense of accomplishment to every member of the team for completed tasks. Facilitating and promoting innovation in a failure tolerant, managed risk, no fear environment, the team will potentially develop unique, superior, and innovative products for the benefit of every stakeholder.

Themes of Findings on Barriers to Applying Leadership Skills

Data analysis of the barriers to the application of leadership skills shows dominant themes such as the deficient skills of the leader, lacking the right team, execution inability, and limited finance. The leader becomes a barrier by exhibiting traits of stubbornness, fixed vision, lack of team spirit, establishing a department based silo operating culture, micromanagement, hierarchical decision-making, and favoritism towards selected people. A weak-skilled leader will struggle to recruit or retain the right team. Such a leader will also encounter difficulty getting buy-in from investors for raising the required financial capital. The combination of weak leadership, incorrect team, and insufficient funding pose significant barriers to effective execution of company tasks and projects, leading to unsustainability of the HT venture.

To overcome the barriers in the application of leadership skills, participants highlighted the requirement for the open culture and trusting leadership theme. Other themes to address barriers in the application of leadership skills are effective execution, MO, and building team trust. Learning

leadership and getting coached is the minor theme to address barriers. Therefore, a leader exhibiting the skills indicated in the themes of the findings for needed leadership skills has the potential to lead HT venture sustainability attainment in the first 5 years of operations.

Themes of Findings on Learning and Developing Leadership

Participants emphasized learning and applying leadership skills as a sustained endeavor for HT entrepreneurs. Aspiring leaders should learn from books and videos on leadership, observe leaders in the workplace, and actively practice the leadership process. Mentoring and coaching resources can provide guidance and counseling to the leader on an ongoing basis and especially in challenging times for HT venture sustainability. Leadership skills evolve continuously, affected by lifestyle and behavioral changes brought on by increasing technology pervasiveness in everyday activities. Understanding of human traits supersedes technical or execution abilities and other operational attributes of a leader because dealing with people is the most significant activity of the leader and the most critical skill of a leader. Developing the necessary human attributes of honesty, transparency, integrity, ethics, humility, passion, and team appreciation is understanding leadership; therefore, participants underscored the necessity of sustained leadership learning and development in all aspects.

Comparison of Findings with Conclusions in Literature Review and in New Studies

The theme findings of leadership skills show agreement with the research findings discussed in the literature review, and new studies published after my proposal. Also, the findings potentially extend knowledge in the leadership discipline. The findings of right team and innovation stimulation theme skills confirm the primary constructs of TFL for the performance of the team and firm (Özer & Tınaztepe, 2014), and superior team NPD performance (Sattayaraksa & Boon-itt, 2016; Sun et al., 2014). Value of right team, innovation stimulation, and execution findings confirm ambidexterity leadership (Zacher & Rosing, 2015). Innovation as an integrated

business process is the basis of systems leadership in the knowledge economy (Johannessen & Skålsvik, 2013). The importance of adaptability theme finding echoes research results of Rolstadås et al. (2014) and Shenhar (2015) on strategic project leadership. Open culture and trust environment, and vision theme skills enhance innovation and NPD processes, required for HT venture sustainability, and are in TFL characteristics (Sattayaraksa & Boon-itt, 2016; Taylor et al., 2014). Innovation or ideation and execution themes identify with the FIRE method (McKinney, 2012).

MO is a unique entrepreneurial attribute (Kam-Sing Wong, 2014) enabling a better understanding of customers, competitors, and environments, and TFL is the initiating step toward creating a market-oriented organizational culture (Gao, 2017). MO is analogous to the focus aspect of the FIRE method to develop innovative market focused products (McKinney, 2012). MO, similar to opportunity recognition, and innovation themes are akin to the Kirznerian and Schumpeterian concepts (De Jong & Marsili, 2015). Leadership learning or development and mentoring appear as embryonic concepts in the new and evolving field of entrepreneurial leadership (Leitch & Volery, 2017). Leitch and Volery considered leadership development as a social process with an active learning approach comprising different activities, events, and exchanges over time. Leadership development is to attain a sense of self and capacity of social interaction, a sense of others espoused Leitch and Volery. I suggest the findings of sustained leadership learning and mentoring, and market orientation extends knowledge in the discipline of entrepreneurial leadership conceptual framework.

The finance theme finds support in the characterization by Hoenig and Henkel (2015) and Wonglimpiyarat (2016) of venture capital finance as the basis of HT venture sustainability. An innovation-based entrepreneurial HT venture requires equity capital as *seed* capital at inception and additional rounds of substantial capital funding until the venture reaches stable positive cash flow

status (Dibrova, 2015; Hellmann &Thiele, 2015). I propose adding venture finance as a construct of entrepreneurial leadership framework. The study findings compare with the discussion in the literature review and and in conclusions of new studies. Also, the findings potentially extend knowledge in the literature on leadership discipline frameworks and effective business practice

Findings in the Context of Conceptual Framework

The themes of the findings of leadership skills for sustainability of an entrepreneurial HT venture in the initial 5 years support the selection of TFL conceptual framework and the applicability of other leadership constructs presented in the literature review. TFL framework characteristics of intellectual stimulation and innovation, organizational or team creativity, openness and trust, vision, and organizational learning are consistent with the themes of the findings. All participants validated the positive influence of these skill themes on creating market-leading high-risk disruptive innovation products conceptualized by Christensen et al. (2016), and advocated by Rolstadås et al. (2014) and Shenhar (2015) in strategic project leadership framework. Ashraf and Khan (2013) inferred the competitive advantage of organizational innovation analogous to the theme of innovation stimulation. Entrepreneurial leadership framework includes MO and leadership learning and development theme findings (Wang et al., 2017). The findings resonate with the constructs of transformational, strategic, project, and entrepreneurial conceptual frameworks, pivoting the sustainability of entrepreneurial HT ventures in a positive direction. The findings further underscore the encompassing coverage of TFL framework features in the theme findings concomitant with the discussion in the conceptual framework.

Reliability and Validity

The assessment of rigor criteria in qualitative studies is dependability, credibility, transferability, and confirmability, analogous to reliability and validity in quantitative studies (Cope, 2014; Kemparaj & Chavan, 2013). I ensured data dependability by creating an audit trail of

transcript verification and member-checking of the audio-recorded interviews and focus group discussion and documented observations and field notes, which I will store for 5 years from the date of CAO approval of the study. Member checking my interpretations of data provided by participants is the indication of data integrity, and credibility of the study. The high quality of data evident in the themes of the findings and data consistency from all participants denoted transferability or external validity. The confirmation of findings in literature studies and suggested knowledge extension to the leadership discipline signifies rich quality and comprehensive quantity of data indicative of trustworthiness of the study.

I used verified transcripts, and member checked interpretations to perform data analysis thereby mitigating bias and personal viewpoints in the findings. The congruency of findings with literature studies and the objectivity of the data supported by the audit trail portend confirmability of the study findings. I triangulated the data by collecting data from participants in the two case study companies in two settings, interview, and focus group discussion, further strengthening the credibility and confirmability of the study. Iterative data analysis yielded no new information, themes, or codes. Therefore, the combination of multiple data sources, rich and comprehensive data collection, appropriate population sample, lack of new themes, and data replicability signifies achievement of data saturation.

Application to Professional Practice

The application of the findings of my study on the exploration of leadership skills entrepreneurs need to sustain their HT entrepreneurial ventures in the first 5 years suggests improved business application practice. The major themes in the findings portend creation of a collaborative goal-driven and high productivity workplace environment where people *enjoy* working. The findings suggest an environment of openness, trust, recognition, respect, and other positive elements of human relationship and understanding encourages a higher commitment level

from workers and generating passion for personal and company success. Implementation of each theme predicts improvement in business practice.

The leader inculcating an innovation mindset augurs inherent benefits in the improvement of business practice. Innovation leaders build better structures and processes for NPD and portfolio management, are proactive, future-oriented, and people-oriented (Gemünden et al., 2018). In the progressively high-tech contemporary 21st century society, adaptive market-oriented innovation success positively correlates with the business success of a company (Gemünden et al., 2018). Such a strategy exemplifies the strategy, 'innovate for HT venture sustainability' recommended by Slater et al. (2014). I propose affecting transilience through innovation can help leaders achieve market traction for venture sustainability. Innovation is knowledge, which is of value to organizations in the contemporary knowledge economy (Lussier & Achua 2015). Competitive advantage accrues to companies with knowledge (intellectual property) assets instead of physical or financial resources advocated Lussier and Achua.

Team agility, defined as the aptitude of a team to quickly respond to changes in the market environment, synonymous with the adaptability and market orientation themes, is of significant import in effectively confronting competitive threats (Liu, Liu, Ding, & Lin, 2015). The innovation savvy and empowered right team, operating in an open culture and trust environment, then, is agile to perform in the turbulent and volatile global market successfully. Shuck, Collins, Rocco, and Diaz (2016) also concluded that high levels of employee engagement increase organizational performance through higher productivity, profitability, employee retention, and customer service. The high achieving and productive employees thrive in a TFL environment and receiving appropriate commendation and recognition from the leader can enhance job satisfaction and reduce burnout (Aydogmus et al., 2018; Hildenbrand et al., 2018).

Leadership style creates an entity identity of the company, which is instrumental in influencing employees in constructing their self-concepts and job attitudes (Lee, Park, & Koo, 2015). With the creation of a positive, open, and high productivity work environment, the leader can provide a sense of belonging to employees with a personal touch. In such a favorable and pleasant workplace, of their volition, the employees go above and beyond their job roles for the benefit of the entity (Lee et al., 2015). Social support, task ownership, and participatory decision-making induce higher employee output observed Keating and Heslin (2015). One study participant described such perspectives in the context of the leader-follower relationship in the work environment, "The leader has to connect with the team at different levels, at a technical level, and the personal level because this is a family that you have put together."

The case study organizations in this study are successful because the leaders implemented the business practices encased in the themes of the findings. The companies operate in separate areas of the HT industry offering distinctly different types of market portfolios and capital structures. One company creates products, and the other company provides services. The capital structures are dissimilar too, one company's capital stock trades publicly and the other company's ownership is private. The discussion in the focus group was notable in the harmony of concepts among the participants from both companies. The similarity of most participants' responses to the questions is symptomatic of comparable experiences and observations. Therefore, the findings suggest the themes' applicability for improvement in the business practice of diverse business types and sectors. Conclusions in the extant literature support the improvement in business practice based on the theme findings.

Implications for Social Change

Leaders and employees of all organizations live in a community. Satisfied and success-oriented people working in an organization led by skilled leaders conducting business practices

based on the study findings portend living happy and contented lives. The positive outlook inherent in such people potentially extends to their families and community engendering a healthy and vibrant community. The findings could produce a positive social change in these individuals with better health in the absence of work stressors, a balanced work-life combination, and happier households signifying reduced healthcare costs, improved children's grades in education, and a higher aspirational lifestyle. Pignata, Boyd, Gillespie, Provis, and Winefield (2016) reported linkage between employee awareness of stress-reduction intervention by senior management and their trustworthiness for positive employee outcomes.

The improved potential for sustainability of entrepreneurial HT ventures based on the findings of this doctoral study could benefit community and society in several ways. Development of cost-effective, innovative products and services by such HT companies implies benefit healthcare, infrastructure, personal safety, education, communications, and other aspects of people's daily lives and in the event of emergencies. Another facet of positive social change is increases in income for local, state, and federal agencies with higher tax and other payments by the companies and employees. Increased incomes of such agencies will benefit society with improved infrastructure, stronger security, crime reduction, and so on. Sustainability of the companies foretells job creation in HT and all other economic sectors. The implications of the findings foreshadow enhanced socioeconomic stability for individuals and their communities.

Recommendations for Action

The objective of my study was to provide HT entrepreneurs a leadership action plan that might assist in the sustainability of their ventures. Entrepreneurs come up with innovative ideas and possess technical expertise in their disciplines but tend to lack understanding of leadership and the business operational structure. Leader as a barrier showed up in responses to the barrier question, discussed in the section themes of findings of barriers to applying leadership skills. Team

chemistry, workflow, markets, customer acquisitions, finance, sales, and overall business management are not all in the entrepreneur's repertoire. The findings of the study might provide the groundwork for entrepreneurs to integrate theme-based actions into their operations plan for a cohesive and coordinated set of steps and activities.

Entrepreneurs might find it useful to include the study findings in discussions with stakeholders and especially capital investors such as VCs and angel investors. It is important for stakeholders to have clear insights of the HT venture's management team, its product portfolio, and market space, and gain confidence in the entrepreneur's leadership abilities to make an informed decision on venture funding. Participants noted the lack of the right team as a barrier to the application of leadership skills. Leadership mentoring, vision, execution, and MO themes in conjunction with the open culture concept are actionable steps suggested for the entrepreneurial leader to take in finding and recruiting the people with the appropriate expertise and competencies. Siliconia, regional cluster, and COI geographic locations may be favorable to recruit the right team and obtain VC or angel financing.

Leadership learning and development supported by mentoring got a recommendation from study participants. The higher the participant's executive role in the company, the stronger was the recommendation for continued leadership learning and executive coaching. The rationale given was that leadership is a *process* without an endpoint. Humanistic understanding of people dynamics, societal norms, and cultural diversity by the leader is of significance. Lussier and Achua (2015) identified leadership as a process, a mentality, and labeled it as everybody's business. Fausing et al. (2015) conceptualized leadership at the team level. Therefore, in an entrepreneurial environment, everyone on the team should have a leadership mindset.

I consider the study findings to have applicability for leaders in growing and mature businesses. There is constant turbulence or unpredictability in contemporary markets, and it affects

all businesses, whether small or large, emergent or established, selling product or service, consumer-focused or business-to-business, domestic or international, essentially all categories of business. Leaders should be alert to the influence of transilience from innovations. A participant summed up the nature of business this way, "A startup company is like an army. A startup is like fighting a war sort of thing." The participant paraphrased from the book, *The art of war*, by Sun Tzu, which the participant recommended for all entrepreneurs. I extend the book recommendation to all business leaders. I suggest the themes of innovation, openness, and trust, market orientation, adaptability, team, and execution have potential validity for leaders in all positions in almost all businesses and industries.

The themes emanating from the study findings could contribute to entrepreneurship training by inclusion in entrepreneurial and leadership courses at the university level. I plan to teach business courses in leadership, high-tech entrepreneurism, innovation management, and finance at the college level by integrating my research process and results. Other options for dissemination of results are articles in scholarly journals and HT industry newspapers.

Recommendations for Further Research

I conducted this qualitative multi-case research study in the San Francisco Bay Area, CA, also known as SV, CA. SV is the preeminent regional cluster and COI. The case-study companies are from the semiconductor segment of the HT industry. These companies offer business-to-business products. Further research recommendations stemming from the study are as follows:

- Conduct research on HT companies with customer-centric products and services. The locations can be in SV and other global COI and Siliconia regions with cultural diversity and varying living standards.

- Comparable research using a quantitative methodology with questions based on the themes of the study findings. Findings of such studies may contribute to a generalizable set of leadership skill themes for HT venture sustainability.
- Conduct research on biotech and health-tech ventures with similar company profiles as in the study to explore leadership skills across sectors of entrepreneurial technology ventures.
- Conduct research on HT venture sustainability by applying different conceptual frameworks such as disruptive innovation theory, organizational theory, and marketing theory.
- The serendipitous findings of leadership learning and development and mentoring themes indicate the potential for research on *active* leadership development and mentoring in the workplace environment. Could a program of "leadership learning moments" based on company events or decisions have feasibility and value? Could such a program have value in venture sustainability?

My suggested recommendations may contribute knowledge in the field of sustainability of innovation-based HT and other types of technology ventures. The free Smart Recorder app for Android operating system offers clear voice quality recording and convenient USB cable uploading to a computer. For audio transcription, I suggest using rev.com because it has higher accuracy thereby saving the researcher valuable editing time. If cost is an issue, transcription via temi.com could be the option. NVivo software is the recommendation for doing data analysis in a qualitative study because of ease of uploading files, node coding, and intuitive navigation.

Reflections

The DBA program at WU is flexible yet rigorous. The doctoral journey broadened my educational and life knowledge and horizons. Learning critical thinking and scholarly analysis

gives me an edge in evaluating issues from multiple perspectives, logically and dispassionately, which is a superior approach with an enhanced mindset. Studying for the doctorate rekindled my affinity of academia, and I hope to have a role in academia after graduation from WU.

I completed the full coursework before starting the doctoral study because my last degree was in 1979. The coursework encompassed marketing, demand management, finance, systems and information management, strategy and innovation, and the research methods subjects. These subjects expanded my existing knowledge and I acquired new learning. I had quality professors for most of the courses and enjoyed and learned from the discussion board interactions with fellow students and the instructor. WU's resources, especially the library and writing center resources, were indispensable throughout the doctoral program. The people in these resource centers were prompt, courteous, and knowledgeable, which expedited progress in the assigned coursework and the doctoral study. The bursar office support can be better, and the online chat feature needs more sophistication and additional personnel. Deficiency in WU's administrative processes came into focus when the resignation of the doctoral committee URR (Dr. Szostek) remained unknown to the Chair and I lost time and momentum because of URR review delays. I also found conflicts in the review feedbacks from the URR and Form & Style reviewer which caused me lost time.

In my self-designed DBA program, I had the flexibility of selecting three specialization courses, and that was helpful in laying the groundwork for this study. The learning in the innovation management, entrepreneurial finance, and strategic leadership courses assisted in creating the framework for the study. The ethics self-check approval process seemed overbearing because the participant profile for the study was of professional, entrepreneurial leaders and thus significantly distinct from the participant profile of implied vulnerability and other limitations found more in the medical field.

The first Chair assignment did not work well in my favor because of limited and reactive guidance, which ended up costing me one lost semester (two course sessions) of progress. The lack of support from the Chair extended the prospectus process, which was frustrating and stressful. I made rapid progress with the helpful guidance and active support of the second Chair and the current committee members, Drs. Chris Beehner (Chair), Tim Malone (SCM), and Judith Blando (URR). Dr. Beehner's prompt and proactive support, and passion to see his student succeed, provided special value. I now see the finish line to this journey and expect to go beyond and contribute meaningfully to promote education, improve leadership, and affect social change.

Conclusion

Leadership is vital for the organization and individual success and the most critical ingredient (Lussier & Achua, 2015). The essence of leadership in organizations revolves around the process of influencing others to understand and agree about the course of action and facilitating individual and collective efforts to accomplish shared objectives (Leitch & Volery, 2017). To achieve these objectives, CEOs need to foster a leadership mentality throughout the organization (Lussier & Achua, 2015). Lussier and Achua cautioned that recruiting, developing, and retaining leadership talent is the most difficult challenge for CEOs in the 21st century.

Entrepreneurs are leaders *par excellence* in identifying opportunities and marshaling resources to exploit such opportunities and create value (Leitch & Volery, 2017). Entrepreneurs could enhance the sustainability of their ventures by applying the leadership skill themes suggested in the findings of the study. The 11 themes of leadership skills applied methodically and proactively, could help entrepreneurs navigate the turbulence of the fast-moving trajectory of the dynamic HT industry and sustain their HT ventures. Increased sustainability of entrepreneurial HT ventures might encourage more HT professionals with innovative ideas to become entrepreneurs.

The HT entrepreneurial ecosystem of COIs and Siliconia could benefit from these activities, and more COIs and Siliconia might arise globally.

Entrepreneurs contribute new economic value sources through their innovation-based HT entrepreneurial ventures (Popa & Vlasceanu, 2014). Entrepreneur innovativeness is an ever-expanding source of job growth in existing and new business functions; and cost-effective, high-value, and low-cost customer-centric and business-focused products and services (Krishna & Subrahmanya, 2015; Simonen et al., 2015). In less than two decades of the 21st century, entrepreneurs' disruptive innovations are fundamentally modifying global industries in a variety of contexts and creating new industries.

Entrepreneurial innovations launch new economic sectors disrupting business models and radically changing business modalities. Creation of the sharing economy headlined by entrepreneurs of Uber, Lyft, and Airbnb poses challenges to the traditional taxicab and hoteling industries. Renewable energy via solar and wind technologies is positively affecting ecology and enabling the extension of electric power to remote areas in the developing world thereby increasing productivity and job creation, and improving education. Electric and hybrid-fuel powered vehicles are commonplace and autonomous (driverless) vehicles are in prototype testing. Application of artificial intelligence and deep learning technologies portend significant influence on lifestyle and lifecare with sweeping changes in healthcare to self-driving vehicles to smart homes. Thus, HT entrepreneurs profoundly contribute to GDP growth and economic vitality and meaningfully and positively affect the quality of life. I posit that enhancement in the sustainability of entrepreneurial HT ventures indicative of far-reaching and long-term benefits to society. The leadership skill themes I found postulate such enhancement in sustainability.

References

Abernathy, W. J., & Clark, K. B. (1985). Innovation: Mapping the winds of creative destruction. *Research Policy*, *14*, 3-22. Retrieved from https://www.journals.elsevier.com/research-policy/

Anokhin, S., Wincent, J., & Oghazi, P. (2016). Strategic effects of corporate venture capital investments. *Journal of Business Venturing Insights*, *5*, 63-69. doi:10.1016/j.jbvi.2016.04.002

Antwi, S. K., & Hamza, K. (2015). Qualitative and quantitative research paradigms in business research: A philosophical reflection. *European Journal of Business and Management, 7*(3), 217-225. Retrieved from http://iiste.org/Journals/index.php/EJBM

Artinger, S., & Powell, T. C. (2016). Entrepreneurial failure: Statistical and psychological explanations. *Strategic Management Journal, 37,* 1047-1064. doi:10.1002/smj.2378

Asah, F., Fatoki, O. O., & Rungani, E. (2015). The impact of motivations, personal values and management skills on the performance of SMEs in South Africa. *African Journal of Economic and Management Studies, 6*, 308-322. doi:10.1108/AJEMS-01-2013-0009

Ashcraft, K. L., & Ashcraft, C. S. (2014). Motifs in the methods section: Representing the qualitative research process. In E. Jeanes & T. Huzzard (Eds.), *Critical management research: Reflections from the field* [E-reader version] (pp.155-172). doi:10.4135/9781446288610

Ashraf, F., & Khan, M. A. (2013). Organizational innovation and organizational effectiveness among employees of cellular companies. *Pakistan Journal of Psychological Research*, *28*(1), 1-24. Retrieved from http://www.pjprnip.edu.pk/

Aydogmus, C., Camgoz, S. M., Ergeneli, A., & Ekmekci, O. T. (2018). Perceptions of transformational leadership and job satisfaction: The roles of personality traits and

psychological empowerment. *Journal of Management & Organization*, *24*, 81-107. doi:10.1017/jmo.2016.59

Bagheri, A. (2017). The impact of entrepreneurial leadership on innovation work behavior and opportunity recognition in high-technology SMEs. *The Journal of High Technology Management Research*, *28*, 159-166. doi:10.1016/j.hitech.2017.10.003

Bass, B. M. (1991). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics*, *18*, 19-31. Retrieved from http://www.journals.elsevier.com/organizational-dynamics

Baù, M., Sieger, P., Eddleston, K. A., & Chirico, F. (2017). Fail but try again? The effects of age, gender, and multiple-owner experience on failed entrepreneurs' reentry. *Entrepreneurship Theory and Practice*, *41*, 909-941. doi:10.1111/etap.12233

Bowers, J., & Khorakian, A. (2014). Integrating risk management in the innovation project. *European Journal of Innovation Management, 17*, 25-40. doi:10.1108/EJIM-01-2013-0010

Brooks, L., & Alam, M. (2015). Designing an information system for updating land records in Bangladesh: Action design ethnographic research. *Information Systems Frontiers, 17*, 79-93. doi:10.1007/s10796-014-9512-7

Bruton, G., Khavul, S., Siegel, D., & Wright, M. (2015). New financial alternatives in seeding entrepreneurship: Microfinance, crowdfunding, and peer-to-peer innovations. *Entrepreneurship Theory and Practice*, *39*, 9-26. doi:10.1111/etap.12143

Campos, H. (2016). The role of creativity in mediating the relationship between entrepreneurial passion and entrepreneurial alertness. *Revista Brasileira De Gestão De Negócios*, *18,* 457-472. doi:10.7819/rbgn.v18i61.3010

Carpentier, C., & Suret, J. M. (2014). Canadian business angel perspectives on exit: A research note. *International Small Business Journal, 33,* 582-593. doi:10.1177/0266242613516140

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum. 41,* 548-547. doi:10.1188/14.ONF.545-547

Cassell, C. (2015). *Conducting research interviews for business and management students.* Thousand Oaks, CA: Sage.

Castillo-Montoya, M. (2016). Preparing for interview research: The interview protocol refinement framework. *The Qualitative Report, 21*(5), 811-830. Retrieved from http://nsuworks.nova.edu/tqr/vol21/iss5/2

Chen, Y., Tang, G., Jin, J., Xie, Q., & Li, J. (2014). CEOs' transformational leadership and product innovation performance: The roles of corporate entrepreneurship and technology orientation. *Journal of Product Innovation Management*, *31*, 2-17. doi:10.1111/jpim.12188

Chen, L. W., & Thompson, P. (2015). Skill balance and entrepreneurship evidence from online career histories. *Entrepreneurship Theory and Practice*, *40,* 289-305. doi:10.1111/etap.12220

Chiaroni, D., Chiesa, V., Franzò, S., Frattini, F., & Urbinati, A. (2016, June). *How incumbents manage waves of disruptive innovation: an empirical analysis*. Paper presented at the XXVII ISPIM Innovation Conference-Blending Tomorrow's Innovation Vintage, Porto, Portugal. Retrieved from https://www.researchgate.net/profile/Andrea_Urbinati/publication/304460400_How_incumbents_manage_waves_of_disruptive_innovation_an_empirical_analysis/links/576ff6a808ae10de639c06b9.pdf

Choudhary, A., Akhtar, S., & Zaheer, A. (2013). Impact of transformational and servant leadership on organizational performance: A comparative analysis. *Journal of Business Ethics, 116*, 433-440. doi:10.1007/s10551-012-1470-8

Christensen, C. M., McDonald, R., Altman, E. J., & Palmer, J. (2016). *Disruptive innovation: Intellectual history and future paths*. Boston, MA: Harvard Business School

Cleary, M., Horsfall, J., & Hayter, M. (2014). Data collection and sampling in qualitative research: Does size matter? *Journal of Advanced Nursing*, *70*, 473-475. doi:10.1111/jan.12163

Clow, K. E., & James, K. E. (2014). *Essentials of marketing research: Putting research into practice* [E-reader version]. doi:10.4135/9781483384726.n4

Colombelli, A., Krafft, J., & Vivarelli, M. (2016). To be born is not enough: The key role of innovative start-ups. *Small Business Economics*, *47*, 277-291. Retrieved from http://link.springer.com/journal/11187

Compton-Lilly, C., Zamzow, L., Cheng, Y., Durón, A., Goralski-Cumbajin, B., Quast, E., & ... Hagerman, D. (2015). Review of qualitative research: An introduction to methods and designs. *Educational Action Research*, *23*, 116-120. doi:10.1080/09650792.2014.942335

Cope, D. G. (2014). Methods and meanings: Credibility and trustworthiness of qualitative research. *Oncology Nursing Forum, 41,* 89-91. Retrieved from https://onf.ons.org/

Corsi, S., & Di Minin, A. (2014). Disruptive innovation… in reverse: Adding a geographical dimension to disruptive innovation theory. *Creativity and Innovation Management*, *23*, 76-90. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-8691

Cunliffe, A. L., & Alcadipani, R. (2016). The politics of access in fieldwork: Immersion, backstage dramas, and deception. *Organizational Research Methods, 19,* 535-561. doi:0.1177/1094428116639134

Cyr, J. (2016). The pitfalls and promise of focus groups as a data collection method. *Sociological*

Methods & Research, *45*, 231-259. doi:10.1177/0049124115570065

Dasgupta, M. (2015). Exploring the relevance of case study research. *Vision: The Journal of Business Perspective*, *19*, 147-160. doi:10.1177/0972262915575661

Dawrs, S. (2016). Pacific literature searches in the internet age. *The Contemporary Pacific*, *28*, 412-426. doi:10.1353/cp.2016.0039

De Jong, J. P., & Marsili, O. (2015). The distribution of Schumpeterian and Kirznerian opportunities. *Small Business Economics*, *44*, 19-35. doi:10.1007/s11187-014-9585-1

Delgado, M., Porter, M. E., & Stern, S. (2014). Clusters, convergence, and economic performance. *Research Policy*, *43*, 1785-1799. Retrieved from http://www.frdelpino.es/wp-content/uploads/2012/11/DPS_w18250.pdf

Denzin, N. K., & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research*. Los Angeles, CA: Sage.

Dibrova, A. (2015). Business angel investments: Risks and opportunities. *Procedia-Social and Behavioral Sciences*, *207*, 280-289. doi:10.1016/j.sbspro.2015.10.097

Dinh, J., Lord, R., Gardner, W., Meuser, J., Liden, R., & Hu, J. (2014). Leadership theory and research in the new millennium: Current theoretical trends and changing perspectives. *The Leadership Quarterly*, *25*, 36-62. doi:10.1016/j.leaqua.2013.11.005

Elo, S., Kaariainen, M., Kanste, O., Polkki, T., Utriainen, K., & Kyngas, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open, 4*(1), 1-10. doi:10.1177/2158244014522633

Engel, J. S. (2015). Global clusters of innovation: Lessons from Silicon Valley. *California Management Review, 57*(2), 36-65. Retrieved from http://cmr.berkeley.edu/

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1-4. doi:10.11648/j.ajtas.20160501.11

Fausing, M. S., Joensson, T. S., Lewandowski, J., & Bligh, M. (2015). Antecedents of shared leadership: Empowering leadership and interdependence. *Leadership & Organization Development Journal*, *36*, 271-291. doi:10.1108/LODJ-06-2013-0075

Flick, U. (2014). *An introduction to qualitative research.* Thousand Oaks, CA: Sage

Frydrych, D., Bock, A., Kinder, T., & Koeck, B. (2014). Exploring entrepreneurial legitimacy in reward-based crowdfunding. *Venture Capital, 16*, 247-269. doi:10.1080/13691066.2014.916512

Fu, X., Li, Y., & Si, Y. (2013). The impact of paternalistic leadership on innovation: An integrated model. *Nankai Business Review International*, *4*, 9-24. doi:10.1108/20408741311303850

Fusch, P., & Ness, L. (2015). Are we there yet? Data saturation in qualitative research. *The Qualitative Report, 20*, 1408-1416. Retrieved from http://tqr.nova.edu/wp-content/uploads/2015/09/fusch1

Gao, Y. (2017). Business leaders' personal values, organisational culture and market orientation. *Journal of Strategic Marketing, 25*, 49-64. doi:10.1080/0965254X.2015.1076879

Gee, J., Loewenthal, D., & Cayne, J. (2015). Psychotherapy and despair in the prison setting. *International Journal of Prisoner Health*, *11*, 141-156. doi:10.1108/IJPH-11-2014-0042

Gemünden, H. G., Lehner, P., & Kock, A. (2018). The project-oriented organization and its contribution to innovation. *International Journal of Project Management. 36,*147-160. doi:10.1016/j.ijproman.2017.07.009

Giannantonio, C. M., & Hurley-Hanson, A. (2016). Entrepreneurial characteristics and careers: American high-tech entrepreneurs. *Journal of Business and Management, 22*, 59-75. Retrieved from https://www.chapman.edu/business/faculty-research/journals-and-essays/jbm-online.aspx

Gill, R., & Larson, G. S. (2014). Making the ideal (local) entrepreneur: Place and the regional development of high-tech entrepreneurial identity. *Human Relations*, *67*, 519-542. doi:10.1177/0018726713496829

Grewal, A., Kataria, H., & Dhawan, I. (2016). Literature search for research planning and identification of research problem. *Indian Journal of Anaesthesia, 60,* 635-639. doi:10.4103/0019-5049.190618

Harvey, L. (2015). Beyond member-checking: A dialogic approach to the research interview. *International Journal of Research & Method in Education*, *38*, 23-38. doi:10.1080/1743727X.2014.914487

Hathaway, I. (2013). Tech starts: High-technology business formation and job creation in the United States. *Ewing Marion Kauffman Foundation Research Paper*. Retrieved from www.kauffman.org

Hellmann, T., & Thiele, V. (2015). Friends or foes? The interrelationship between angel and venture capital markets. *Journal of Financial Economics*, *115*, 639-653. doi:10.1016/j.jfineco.2014.10.009

Hildenbrand, K., Sacramento, C. A., & Binnewies, C. (2018). Transformational leadership and burnout: The role of thriving and followers' openness to experience. *Journal of Occupational Health Psychology*, *23*(1), 31-43. doi:10.1037/ocp0000051

Hoch, J. E., & Kozlowski, S. W. (2014). Leading virtual teams: Hierarchical leadership, structural supports, and shared team leadership. *Journal of Applied Psychology, 99,* 390-403. doi:10.1037/a0030264

Hoegl, M., & Muethel, M. (2016). Enabling shared leadership in virtual project teams: A practitioners' guide. *Project Management Journal, 47*(1), 7-12. doi:10.1002/pmj.21564

Hoenig, D., & Henkel, J. (2015). Quality signals? The role of patents, alliances, and team experience in venture capital financing. *Research Policy, 44,* 1049-1064. doi:10.1016/j.respol.2014.11.011

Houghton, C., Casey, D., Shaw, D, & Murphy, K. (2013). Rigour in qualitative case-study research. *Nurse Researcher, 20*(4), 12-17. Retrieved from http://journals.rcni.com/journal/nr

Hu, H., Gu, Q., & Chen, J. (2013). How and when does transformational leadership affect organizational creativity and innovation? *Nankai Business Review International, 4*, 147-166. doi:10.1108/20408741311323344

Jia, Y. G. (2015). Financing high-tech start-ups: Moral hazard, information asymmetry and the reallocation of control rights. *The BE Journal of Economic Analysis & Policy*, *15*, 685-708. doi:10.1515/bejeap-2013-0190

Johannessen, J-A., & Skålsvik, H. (2013). The systemic leaders: new leaders in the global economy. *Kybernetes, 42*, 13-34. doi:10.1108/03684921311295457

Kam-Sing Wong, S. (2014). Impacts of environmental turbulence on entrepreneurial orientation and new product success. *European Journal of Innovation Management, 17,* 229-249. doi:10.1108/EJIM-04-2013-0032

Kao, P., Pai, P., Lin, T., & Zhong, J. (2015). How transformational leadership fuels employees' service innovation behavior. *The Service Industries Journal*, *35,* 448-466. doi:10.1080/02642069.2015.1015519

Keating, L. A., & Heslin, P. A. (2015). The potential role of mindsets in unleashing employee engagement. *Human Resource Management Review, 25,* 329–341. doi:10.1016/j.hrmr.2015.01.008

Kemparaj, U., & Chavan, S. (2013). Qualitative research: a brief description. *Indian Journal of Medical Sciences*, *67*(3), 89-98. doi:10.4103/0019-5359.121127

Keutel, M., Michalik, B., & Richter, J. (2014). Towards mindful case study research in IS: A critical analysis of the past ten years. *European Journal of Information Systems, 23*, 256-272. doi:10.1057/ejis.2013.26

Khan, S. N. (2014). Qualitative research method - phenomenology. *Asian Social Science, 10,* 298-310. doi:10.5539/ass.v10n21p298

Kidney, C. A., & McDonald, K. E. (2014). A toolkit for accessible and respectful engagement in research. *Disability & Society*, *29*, 1013-1030. doi:10.1080/09687599.2014.902357

Kim, Y., & Vonortas, N. S. (2014). Managing risk in the formative years: Evidence from young enterprises in Europe. *Technovation*, *34*, 454-465. doi:10.1016/j.technovation.2014.05.004

King, A. A., & Baatartogtokh, B. (2015). How useful is the theory of disruptive innovation? *MIT Sloan Management Review*, *57*, 77-90. Retrieved from http://sloanreview.mit.edu/

Krishna, H. S., & Subrahmanya, M. B. (2015). Transnational entrepreneurship and Indian high-tech start-up survival: An empirical investigation. *South Asian Journal of Management*, *22*(2), 81-99. Retrieved from http://www.sajm-amdisa.org

Laufer, A. (2012). *Mastering the leadership role in project management: Practices that deliver remarkable results.* Upper Saddle River, NJ: FT Press.

Lee, E. S., Park, T. Y., & Koo, B. (2015). Identifying organizational identification as a basis for attitudes and behaviors: A meta-analytic review. *Psychological Bulletin, 141,* 1049-1080. doi:10.1037/bul0000012

Leitch, C. M., & Volery, T. (2017). Entrepreneurial leadership: Insights and directions. *International Small Business Journal, 35*, 147-156. doi:10.1177/0266242616681397

LeLoarne, S., & Maalaoui, A. (2015). How high-tech entrepreneurs bricole the evolution of business process management for their activities. *Business Process Management Journal, 21*, 152-171. doi:10.1108/BPMJ-03-2014-0024

Lewis, S. (2015). Qualitative inquiry and research design: Choosing among five approaches. *Health Promotion Practice*, *16,* 473-475. doi:10.1177/1524839915580941

Liu, M. L., Liu, N. T., Ding, C. G., & Lin, C. P. (2015). Exploring team performance in high-tech industries: Future trends of building up teamwork. *Technological Forecasting and Social Change, 91,* 295-310. doi:10.1016/j.techfore.2014.03.014

Löfsten, H. (2016). New technology-based firms and their survival: The importance of business networks, and entrepreneurial business behaviour and competition. *Local Economy*, *31*, 393-409. doi:10.1177/0269094216637334

Lussier, R. N., & Achua, C. F. (2015). *Leadership: Theory, application, & skill development.* Nelson Education, United States. South-Western Cengage Learning

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: guided by information power. *Qualitative Health Research, 26,* 1753-1760. doi:10.1177/1049732315617444

Maramwidze-Merrison, E. (2016). Innovative methodologies in qualitative research: Social media window for accessing organisational elites for interviews. *Electronic Journal of Business Research Methods, 14*, 157-167. Retrieved from http://www.ejbrm.com/main.html

McCleskey, J. A. (2014). Situational, transformational, and transactional leadership and leadership development. *Journal of Business Studies Quarterly*, (*5*), 117- 130. Retrieved from http://jbsq.org/

McCusker, K., & Gunaydin, S. (2015). Research using qualitative, quantitative or mixed methods and choice based on the research. *Perfusion*, *30*, 537-542. doi:10.1177/0267659114559116

McKinney, P. (2012). *Beyond the obvious: Killer questions that spark game-changing innovation.* New York, NY: Hyperion.

Mesu, J., Sanders, K., & Riemsdijk, M. V. (2015). Transformational leadership and organisational commitment in manufacturing and service small to medium-sized enterprises: The moderating effects of directive and participative leadership. *Personnel Review, 44,* 970-990. doi:10.1108/PR-01-2014-0020

Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, *29*(1), 1-16. Retrieved from http://www.journals.elsevier.com/journal-of-business-venturing/

Moghaddam, K., Aidov, A., DuVal, C., & Azarpanah, S. (2017). High-growth entrepreneurial firm funding: a qualitative study of native-born and immigrant entrepreneurs. *Venture Capital*, *19*, 75-94. doi:10.1080/13691066.2016.1256295

National Institutes of Health (NIH). (2014). *The Belmont Report* (April 18, 1979). Retrieved from https://science.education.nih.gov/supplements/nih9/bioethics/guide/teacher/Mod5_Belmont.pdf

Ng, A., Macbeth, D., & Southern, G. (2014). Entrepreneurial performance of early-stage

ventures: Dynamic resource management for development and growth. *The International Entrepreneurship and Management Journal, 10*, 503-521. doi:10.1007/s11365-014-0303-x

Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence Based Nursing*, *18*, 34-35. Retrieved from http://ebn.bmj.com/

Olsen, W. (2014). Focus groups. In *Data collection: Key debates and methods in social research* (pp. 77-78). doi:10.4135/9781473914230.n13

Øye, C., Sørensen, N. Ø., & Glasdam, S. (2016). Qualitative research ethics on the spot: Not only on the desktop. *Nursing Ethics*, *23*, 455-464. doi:10.1177/0969733014567023

Özer, F., & Tınaztepe, C. (2014). Effect of strategic leadership styles on firm performance: A study in a Turkish SME. *Procedia-Social and Behavioral Sciences*, *150*, 778-784. doi:10.1016/j.sbspro.2014.09.059

Park, J., & Park, M. (2016). Qualitative versus quantitative research methods: Discovery or justification? *Journal of Marketing Thought*, *3*(1), 1-7. doi:10.15577/jmt.2016.03.01.1.

Parker, S. C. (2018). *The economics of entrepreneurship*. Cambridge, U.K. Cambridge University Press

Paswan, A. K. (2014). The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators. *Journal of Product & Brand Management*. *23*, 240-240. doi:10.1108/JPBM-06-2013-0328

Paulsen, N., Callan, V., Ayoko, O., & Saunders, D. (2013). Transformational leadership and innovation in an R&D organization experiencing major change. *Journal of Organizational Change Management, 26,* 595-610. doi:10.1108/0953481131132859

Peticca-Harris, A., deGama, N., & Elias, S. R. (2016). A dynamic process model for finding informants and gaining access in qualitative research. *Organizational Research Methods*, *19*, 376-401. doi:10.1177/1094428116629218

Pignata, S., Boyd, C., Gillespie, N., Provis, C., & Winefield, A. H. (2016). Awareness of stress-reduction interventions: The impact on employees' well-being and organizational attitudes. *Stress and Health, 32,* 231-243. doi:10.1002/smi.2597

Popa, I., & Vlasceanu, **C.** (2014). Innovation: A strategic option for future economic growth. *Annals of The University Of Oradea, Economic Science Series*, *23*, 1220-1225. Retrieved from http://www.oalib.com/journal/10997/1#.V8-Qp636UZw

Qiu, X. & Wang, C. (2016). Literature searches in the conduct of systematic reviews and evaluations. *Shanghai Archives of Psychiatry, 28,* 154-159. doi:10.11919/j.issn.1002-0829.215008

Ravishankar, M. N. (2016). A bricolage perspective on technological innovation in emerging markets. *IEEE Transactions on Engineering Management*, *63*, 53-66. doi:10.1109/TEM.2015.2494501

Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (Eds.). (2013). *Qualitative research practice: A guide for social science students and researchers*. Los Angeles, CA: Sage.

Robbins, P., & O'Gorman, C. (2015). Innovating the innovation process: An organisational experiment in global pharma pursuing radical innovation. *R&D Management*, *45*, 76-93. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-9310

Robinson, O. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology, 11*(1), 25-41. doi:10.1080/14780887.2013.801543

Rolstadås, A., Tommelein, I., Schiefloe, P., & Ballard, G. (2014). Understanding project success through analysis of project management approach. *International Journal of Managing Projects in Business, 7*, 638-660. doi:10.1108/IJMPB-09-2013-0048

Sandström, C., Berglund, H., & Magnusson, M. *(*2014). Symmetric assumptions in the theory of disruptive innovation: Theoretical and managerial implications. *Creativity and Innovation Management*, *23*, 472-483. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-8691

Sanjari, M., Bahramnezhad, F., Fomani, F. K., Shoghi, M., & Cheraghi, M. A. (2014). Ethical challenges of researchers in qualitative studies: The necessity to develop a specific guideline. *Journal of Medical Ethics and History of Medicine*, *7*(14)*,* 1-6. Retrieved from http://jmehm.tums.ac.ir/index.php/jmehm

Sarasvathy, S., Menon, A., & Kuechle, G. (2013). Failing firms and successful entrepreneurs: Serial entrepreneurship as a temporal portfolio. *Small Business Economics*, *40*, 417-434. Retrieved from http://link.springer.com/journal/11187

Sattayaraksa, T., & Boon-itt, S. (2016). CEO transformational leadership and the new product development process. *Leadership & Organization Development Journal, 37*, 730-749. doi:10.1108/LODJ-10-2014-0197

Shafie, S., Siti-Nabiha, A., & Tan, C. (2014). Organizational culture, transformational leadership and product innovation: A conceptual review. *International Journal of Organizational Innovation, 7,* 30-43. Retrieved from http://www.ijoi-online.org/

Shenhar, A. (2015). What is strategic project leadership? *Open Economics and Management Journal*, *2*, 29-37. doi:10.2174/2352630001502010029

Shin, H., Shin, J., Yoo, S., Song, J., & Kim, A. (2015). Strategic delegation, quality competition, and new product profitability. *Management Decision, 53*, 713-729. doi:10.1108/MD-05-2014-0318

Shuck, B., Collins, J. C., Rocco, T. S., & Diaz, R. (2016). Deconstructing the privilege and power of employee engagement: Issues of inequality for management and human resource

development. *Human Resource Development Review, 15,* 208-229. doi:10.1177/1534484316643904

Silva, A. (2016). What is leadership? *Journal of Business Studies Quarterly, 8*(1), 1-5. Retrieved from http://jbsq.org/

Simonen, J., Svento, R., & Juutinen, A. (2015). Specialization and diversity as drivers of economic growth: Evidence from high-tech industries. *Papers in Regional Science*, *94*, 229-247. doi:10.1111/pirs.12062

Singh, K. D. (2015). Creating your own qualitative research approach: Selecting, integrating and operationalizing philosophy, methodology and methods. *Vision, 19,* 132-146. doi:10.1177/0972262915575657

Slater, S. F., Mohr, J. J., & Sengupta, S. (2014). Radical product innovation capability: Literature review, synthesis, and illustrative research propositions. *Journal of Product Innovation Management, 31,* 552-566. doi:10.1111/jpim.12113

Slavik, J., Putnova, A., & Cebakova, A. (2015). Leadership as a tool of strategic management. *Procedia Economics and Finance*, *26*, 1159-1163. doi:10.1016/S2212-5671(15)00946-6

Sotiriadou, P., Brouwers, J., & Le, T. (2014). Choosing a qualitative data analysis tool: A comparison of NVivo and Leximancer. *Annals of Leisure Research, 17*, 218-234, doi:10.1080/11745398.2014.902292

Stauffer, D. (2016). Personal innovativeness as a predictor of entrepreneurial value creation. *International Journal of Innovation Science*, *8,* 4-26. doi:10.1108/IJIS-03-2016-001

Stenholm, P., & Renko, M. (2016). Passionate bricoleurs and new venture survival. *Journal of Business Venturing*, *31***,** 595-611. doi:10.1016/j.jbusvent.2016.05.004

Sun, W., Xu, A., & Shang, Y. (2014). Transformational leadership, team climate, and team performance within the NPD team: Evidence from China. *Asia Pacific Journal of Management*, *31*, 127-147. doi:10.1007/s10490-012-9327-3

Talanquer, V. (2014). Using qualitative analysis software to facilitate qualitative data analysis. *Tools of Chemistry Education Research*, *1166,* 83-95. doi:10.1021/bk-2014-1166.ch005

Tam, N., Huy, N., Thoa, L., Long, N., Trang, N., Hirayama, K., & Karbwang, J. (2015). Participants' understanding of informed consent in clinical trials over three decades: Systematic review and meta-analysis. *Bulletin of the World Health Organization*, *93,* 186-198. doi:10.2471/BLT.14.141390

Taylor, C., Cornelius, D., & Colvin, K. (2014). Visionary leadership and its relationship to organizational effectiveness. *Leadership & Organization Development Journal, 35*, 566-583. doi:10.1108/LODJ-10-2012-0130

Tsvetkova, A., Thill, J. C., & Strumsky, D. (2014). Metropolitan innovation, firm size, and business survival in a high-tech industry. *Small Business Economics*, *43*, 661-676. doi:10.1007/s11187-014-9550-z

Van Stel, A., Millán, J. M., & Román, C. (2014). Investigating the impact of the technological environment on survival chances of employer entrepreneurs. *Small Business Economics*, *43*, 839-855. doi:10.1007/s11187-014-9565-5

Vandenbroucke, E., Knockaert, M., & Ucbasaran, D. (2016). Outside board human capital and early stage high-tech firm performance. *Entrepreneurship Theory and Practice*, *40*, 759-779. doi:10.1111/etap.12141

Venkatesh, V., Brown, S. A., & Sullivan, Y. W. (2016). Guidelines for conducting mixed-methods research: An extension and illustration. *Journal of the Association for Information Systems, 17*, 435-494. Retrieved from http://aisel.aisnet.org/jais/

Walden University, (2016). *DBA doctoral study rubric and research handbook*. https://drive.google.com/file/d/0B4XiaHN6ICGIT0FLdVF5WEg0MHc/view

Wallace, M., & Sheldon, N. (2015). Business research ethics: Participant observer perspectives. *Journal of Business Ethics, 128*, 267-277. doi:10.1007/s10551-014-2102-2

Wan, F., Williamson, P. J., & Yin, E. (2015). Antecedents and implications of disruptive innovation: Evidence from China. *Technovation*, *39*, 94-104. doi:10.1016/j.technovation.2014.05.012

Wang, C. H., Chang, C. H., & Shen, G. C. (2015). The effect of inbound open innovation on firm performance: Evidence from high-tech industry. *Technological Forecasting and Social Change, 99,* 222-230. doi:10.1016/j.techfore.2015.07.006

Wang, T., Thornhill, S., & De Castro, J. O. (2017). Entrepreneurial orientation, legitimation, and new venture performance. *Strategic Entrepreneurship Journal*. *11*, 373-392. doi:10.1002/sej.1246

Wang, C. J., Tsai, H. T., & Tsai, M. T. (2014). Linking transformational leadership and employee creativity in the hospitality industry: The influences of creative role identity, creative self-efficacy, and job complexity. *Tourism Management, 40,* 79-89. doi:10.1016/j.tourman.2013.05.008

Wonglimpiyarat, J. (2016). Exploring strategic venture capital financing with Silicon Valley style. *Technological Forecasting and Social Change*, *102*, 80-89. doi:10.1016/j.techfore.2015.07.007

Yang, Y., Narayanan, V. K., & De Carolis, D. M. (2014). The relationship between portfolio diversification and firm value: The evidence from corporate venture capital activity. *Strategic Management Journal*, *35*, 1993-2011. doi:10.1002/smj.2190

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education, 48,* 311-325. doi:10.1111/ejed.12014

Yin, R. K. (2017). *Case study research and applications: Design and methods* (6th ed.). Thousand Oaks, CA: Sage.

Yu, X., Chen, Y., & Nguyen, B. (2014). Knowledge management, learning behavior from failure and new product development in new technology ventures. *Systems Research and Behavioral Science*, *31*, 405-423. doi:10.1002/sres.2273

Yu, B., Hao, S., Ahlstrom, D., Si, S., & Liang, D. (2014). Entrepreneurial firms' network competence, technological capability, and new product development performance. *Asia Pacific Journal of Management, 31,* 687-704. doi:10.1007/s10490-013-9365-5

Zacher, H., & Rosing, K. (2015). Ambidextrous leadership and team innovation. *Leadership & Organization Development Journal*, *36*, 54-68. doi:10.1108/lodj-11-2012-0141

Zamawe, F. C. (2015). The implication of using NVivo software in qualitative data analysis: Evidence-based reflections. *Malawi Medical Journal*, *27*, 13-15. doi:10.4314/mmj.v27il.4

Zervas, G., Proserpio, D., & Byers, J. W. (2017). The rise of the sharing economy: Estimating the impact of Airbnb on the hotel industry. *Journal of Marketing Research*, *54*, 687-705. Retrieved from https://www.ama.org/publications/JournalOfMarketingResearch/Pages/current-issue.aspx

Zhou, W., Hu, H., & Zey, M. (2015). Team composition of new venture founding teams: Does personality matter? *International Journal of Entrepreneurial Behavior & Research, 21*, 673-689. doi:10.1108/IJEBR-04-2014-0072

Appendix A: Interview Questions

1. How do you define leadership skills required to support HT ventures during the first 5 years of operations?
2. What are the barriers to applying leadership skills to sustain HT ventures in the first 5 years of operations?
3. How did you address each barrier?
4. What key leadership skills are necessary to sustain HT ventures during the first 5 years of operations?
5. Which of these leadership skills proved to be most effective?
6. How did you learn about leadership skills that support HT ventures during the first 5 years of operations?
7. What other related information would you like to share that, based on your experience, could be helpful in understanding leadership skills for sustaining HT ventures during the first 5 years of operations?

Appendix B: Interview and Group Discussion Protocol

The protocol is the same for in-depth interviews and focus group discussions. The setting and the sequence and series of interview questions will apply to every interview and discussion. I will watch for non-verbal cues in every setting and prompt group interaction in focus group discussion. The plan is for a 60 to 75 minute interview or discussion. Interview transcript verification and member checking will confirm the efficacy of transcribing and interpreting the participant's answers.

Protocol

1. Introductions and setting the stage
2. Sign the interview or discussion consent form, reviewing the contents, and answering participant questions. Provide a copy of the signed consent form to the participant(s).
3. Prior to beginning the interview or discussion, I will start the audio recording device by stating the location, date and time of the interview and the interviewee's name or focus group participant names for the group focus discussion with the coded identifications to preserve anonymity.
4. Conduct the interview or discussion using the prepared questions.
5. Ask additional questions of the participant, as applicable.
6. End interview or discussion. Confirm member checking and transcript review process with the participant(s).
7. Discuss follow-up process with the participant(s) for a potential second interview or discussion and for any potential participant concerns.

Conclude by thanking the participant(s), shutoff the recording device, and leave.

Appendix C: Invitation to Participate in a Research Study – One-on-One Interviews

Greetings Mr. or Mrs. /Ms. or Dr. XX YY

I am a doctoral student at Walden University pursuing a degree in Doctorate of Business Administration. I extend you an invitation to participate voluntarily in my doctoral study as an interviewee on the topic, "Leadership Skills to Sustain High-tech Entrepreneurial Ventures". The purpose of the study is to explore the skills high-tech (HT) entrepreneurial venture leaders use to sustain their ventures in the first 5 years of operations. Participant eligibility criteria are entrepreneurial leaders with an undergraduate or higher academic degree and experiential background in sustaining the HT entrepreneurial venture in the first 5 years of operations. All participants in the study are from Silicon Valley, CA geographical location, which extends south from San Francisco through the Bay Area to the southern end of San Jose. My objective in inviting your participation in one-on-one interviews is to collect information from you pertinent to my doctoral research study by asking specific questions on such leadership skills.

I will merge the information you provide with that of other participants, and the data analysis process will remove the origin or provider of the collected information. This invitation to participate is in response to your request pursuant to our phone conversation. If you decline to participate, you may disregard this invitation. Please contact me via email at zoaib.rangwala@waldenu.edu or by phone at 408-828-1438 for any questions or concerns. I express sincere appreciation for your time and courtesy.

Thank you.

Respectfully,

Zoaib Rangwala

Doctorate of Business Administration Candidate

Appendix D: Invitation to Participate in a Research Study – Focus Group Discussion

Greetings Mr. or Mrs. /Ms. or Dr. XX YY

I am a doctoral student at Walden University pursuing a degree in Doctorate of Business Administration. I extend you an invitation to participate voluntarily in my doctoral study. I request you to participate in a four-person focus group discussion on the topic, "Leadership Skills to Sustain High-tech Entrepreneurial Ventures". The purpose of the study is to explore the skills high-tech (HT) entrepreneurial venture leaders use to sustain their ventures in the first 5 years of operations. Participant eligibility criteria are entrepreneurial leaders with an undergraduate or higher academic degree and experiential background in sustaining the HT entrepreneurial venture in the first 5 years of operations. All participants in the focus group are from Silicon Valley, CA geographical location, which extends south from San Francisco through the Bay Area to the southern end of San Jose. My objective in requesting your participation in the focus group discussion is to collect information from you and other group participants pertinent to my doctoral research study by asking specific questions on the use of leadership skills.

I will merge the information you provide with that of other participants, and the data analysis process will remove the origin or provider of the collected information. This invitation to participate is in response to your request pursuant to our phone conversation. If you decline to participate, you may disregard this invitation. Please contact me via email at zoaib.rangwala@waldenu.edu or by phone at 408-828-1438 for any questions or concerns.

I express my sincere appreciation for your time and courtesy.

Thank you.

Respectfully,

Zoaib Rangwala

Doctorate of Business Administration Candidate

Appendix E: Interview - Informed Consent Form

I invite you to take part in a research study focusing on exploring leadership skills entrepreneurial leaders use to sustain their entrepreneurial high-tech (HT) venture during the first 5 years of operation. The eligibility or inclusion criteria for a participant are an undergraduate or higher academic degree and leadership experience in sustaining the HT entrepreneurial venture in the first 5 years of operations. The participant is in the employ of one of the two HT companies I am studying. All participants are from Silicon Valley, CA, which is the geographical location of my study, where both these companies have headquarters. Participation is voluntary and you may withdraw at any time if you so desire. This "informed consent" form enables you to understand the nature of the study prior to deciding to participate.

I, Zoaib Rangwala, am conducting the study as a doctoral student at Walden University. You might already know me or know of me as an investor in Exodus and other HT companies, CEO of Semi-Custom Logic, and or co-founder of VPNet Inc., or as an HT industry professional. However, this study is completely separate and standalone from my HT industry roles or functions. If you do know me, please be assured that declining or discontinuing participation will not will not negatively affect your relationship with me or (if applicable) your access to services.

Following are three sample questions I will ask:

1. How do you define leadership skills required to support HT ventures during the first 5 years of operations?
2. What are the barriers to applying leadership skills to sustain HT ventures in the first 5 years of operations?
3. How did you address each barrier?

If you decide to participate, I will setup an initial interview at your convenience in a private location such as a conference room to ask you 7 open-ended questions that you can answer based on your leadership experience and knowledge. Procedurally, the audio recorded interview will last between 60-75 minutes and I will request you to put your cell phone in "Do not disturb" mode. Predicated on the responses in the first interview, I may request a second interview with follow-up questions. There will be a maximum of two interviews. In a subsequent meeting, I will request you to review and comment on the interview transcripts and my interpretation of your responses or "collected data". In the study, I will anonymize your identity and maintain confidentiality of the data you provide. I will securely store all data for 5 years from the date of my doctoral study approval. There is minimal risk in participating, however, I do not foresee any harm or risk coming to you whether you participate or not. Your participation requires a time commitment and possible travel to the meeting location.

The research results from my study may or may not offer any direct benefits to you as a participant. With the potential of increased sustainability of HT ventures based on the study results, I anticipate benefits to society in the form of new cost-effective, innovative, higher quality, and safer products and services.

Compensation

Participants in the study will not receive any compensation.

Privacy and Confidentiality

All information you provide will be confidential and will not relate to you. I will not use your information for any purposes outside of this research project. Your name or any other information you provide that could compromise your identity will remain confidential.

Contacts and Questions

You may contact the researcher (I) via email at zoaib.rangwala@waldenu.edu or via telephone 408-828-1438 if you have any questions pertaining to this study. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 1-800-925-3368, extension 3121210 from within the USA, 001-612-312-1210 from outside the USA, or via email address irb@waldenu.edu.

Walden University's approval number for this study is 09-25-17-0387400 and it expires on September 24th, 2018.

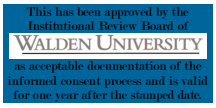
If you decide to participate, please do the following.

Statement of Consent

I have read and understood the above information, my role as a research participant, and the purpose of the study to make an informed decision about my participation. By replying to this email (from zoaib.rangwala@waldenu.edu) with the words "I consent", I am agreeing to participate in the study.

Please keep an electronic or printed copy of the consent form in your records. Thank you.

2017.09.25
15:46:12
-05'00'



Appendix F: Focus Group – Informed Consent Form

I invite you to take part in a research study as a participant in a focus group discussion of four participants, focusing on exploring leadership skills entrepreneurial leaders use to sustain their entrepreneurial high-tech (HT) venture during the first 5 years of operation. The eligibility or inclusion criteria for a participant are an undergraduate or higher academic degree and leadership experience in sustaining the HT entrepreneurial venture in the first 5 years of operations. The participant is in the employ of one of the two HT companies I am studying. All participants are from Silicon Valley, CA, which is the geographical location of my study, where both these companies have headquarters. Participation is voluntary and you may withdraw at any time if you so desire. This "informed consent" form, sent via email, enables you to understand the nature of the study prior to making a decision to participate.

I, Zoaib Rangwala, am conducting the study as a doctoral student at Walden University. You might already know me or know of me as an investor in Exodus and other HT companies, CEO of Semi-Custom Logic, and or co-founder of VPNet Inc., or as an HT industry professional. However, this study is completely separate and standalone from my HT industry roles or functions. If you do know me, please be assured that declining or discontinuing participation will not negatively affect your relationship with me or (if applicable) your access to services.

The questions I will ask in the focus group discussion are:

1. How do you define leadership skills required to support HT ventures during the first 5 years of operations?
2. What are the barriers to applying leadership skills to sustain HT ventures in the first 5 years of operations?

3. How did you address each barrier?
4. What key leadership skills are necessary to sustain HT ventures during the first 5 years of operations?
5. Which of these leadership skills proved to be most effective?
6. How did you learn about leadership skills that support HT ventures during the first 5 years of operations?
7. What other related information would you like to share that, based on your experience, could be helpful in understanding leadership skills for sustaining HT ventures during the first 5 years of operations?

If you decide to participate, you will be part of a focus group discussion of four HT industry peers including yourself. I will setup the first group discussion meeting convenient to all participants in a private location (closed to outsiders and with participants requested to put their phones in "Do not disturb" mode) and will ask the group open-ended questions as shown above for everyone to respond based on their individual leadership experience and knowledge. I encourage a free and open discussion on each question. Please note that what is said in the focus group discussion is confidential and should not be repeated or discussed outside of the focus group meeting. Nonetheless, be aware that others may repeat or mention what was said in the focus group.

In the study, I will anonymize your identity and maintain confidentiality of the data you provide. Procedurally, the audio recorded group discussion (there will be no video recording) will last not more than 2 hours. Based on the discussion responses in the first meeting, I may request a second group discussion with the same participants with follow-up questions. In a subsequent meeting, I will ask you and other group participants to review and comment on the

meeting transcript(s) and my interpretation of the responses or "collected data" provided by each participant. I will securely store all data for 5 years from the date of my doctoral study approval. There is minimal risk in participating, however, I do not foresee any harm or risk coming to you whether you participate or not. You may be uncomfortable voicing opinions in a group format. Your participation requires a time commitment and possible travel to the meeting location.

The research results from my study may or may not offer any direct benefits to you as a participant. With the potential of increased sustainability of HT ventures based on the study results, I anticipate benefits to society in the form of new cost-effective, innovative, higher quality, and safer products and services.

Compensation

Participant in the study will not receive any compensation.

Privacy and Confidentiality

All information you provide will be confidential and will not relate to you. I will not use your information for any purposes outside of this research project. Your name or any other information you provide that could compromise your identity will remain confidential.

Contacts and Questions

You may contact the researcher (I) via email at zoaib.rangwala@waldenu.edu or via telephone 408-828-1438 if you have any questions pertaining to this study. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone numbers are 1-800-925-3368, extension 3121210, 001-612-312-1210 from outside the USA, or via email address irb@waldenu.edu.

Walden University's approval number for this study is 09-25-17-0387400 and it expires on September 24th, 2018.

If you decide to participate, please do the following.

Statement of Consent

I have read and understood the above information, my role as a research participant, and the purpose of the study to make an informed decision about my participation. By replying to this email (from zoaib.rangwala@waldenu.edu) with the words "I consent", I am agreeing to participate in the study.

Please keep an electronic or printed copy of the consent form in your records. Thank you.

2017.09.25
15:45:24
-05'00'

Appendix G: Letter of Cooperation from Open-Silicon

Open Silicon

your Idea. Delivered.™
Open-Silicon
Taher Madraswala, V: 916-521-2144, E: taher.madraswala@open-silicon.com

Letter of Cooperation

September 11, 2017

Dear Zoaib Rangwala,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Leadership Skills to Sustain High-tech Entrepreneurial Ventures within Open-Silicon. As part of this study, I authorize you to contact company employees fitting the eligibility criteria for your study, collect data from such individuals by asking questions pertaining to your study, perform transcript review and member-checking, and disseminate a summary of the research results to the selected participants and to Cavium. Note that individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include providing a closed-door and private conference room for you to conduct your data collection and verification activities. We reserve the right to withdraw from the study at any time if our circumstances change.

I understand that you, the research student, will not be naming our organization in the doctoral project report published in ProQuest.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

Taher Madraswala
President and CEO
OPEN-SILICON, Inc.
V: 916-521-2144
E: taher.madraswala@open-silicon.com

Open-Silicon

490 N McCarthy Blvd, Suite 220,
Milpitas, CA 95035
T: 408.240.5700, F: 408.240.5701, www.open-silicon.com

Appendix H: Letter of Cooperation from Cavium

Cavium
M Raghib Hussain, V: 408-202-4861, E: raghib@cavium.com

September 11, 2017

Dear Zoaib Rangwala,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Leadership Skills to Sustain High-tech Entrepreneurial Ventures within Cavium. As part of this study, I authorize you to contact company employees fitting the eligibility criteria for your study, collect data from such individuals by asking questions pertaining to your study, perform transcript review and member-checking, and disseminate a summary of the research results to the selected participants and to Cavium. Note that individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include providing a closed-door and private conference room for you to conduct your data collection and verification activities. We reserve the right to withdraw from the study at any time if our circumstances change.

I understand that you, the research student, will not be naming our organization in the doctoral project report published in ProQuest.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,
M Raghib Hussain,
COO and CTO, Cavium

Cavium letter of cooperation - 201710

Appendix I: Doctoral Study Overview for Potential Participants

Researcher: Zoaib Rangwala

Topic: Leadership Skills to Sustain High-Tech Entrepreneurial Ventures

University: Walden University

Status of Study: I completed and received doctoral committee approval of the Prospectus and Proposal sections of my study. With the consent from the Institutional Review Board (IRB), an independent body, which monitors ethical integrity by the researcher in the data collection process, I am collecting research data from participants on the topic of leadership skills.

Problem Statement: The general problem is that the highly competitive and dynamic market environment negatively affects some HT entrepreneurs, which results in failures of their ventures. The specific business problem is that some HT entrepreneurial leaders lack leadership skills to sustain their HT ventures during the first 5 years of operations.

- Type of research: This is a qualitative case study research involving two companies. The case-study companies are Cavium and Open-Silicon.
- Data collection approach: Data collection is in two modes: one-on-one interviews and a focus group discussion. The objective is to obtain a cross-section of rich information for data analysis and study findings. I will ask the same questions of all participants.
    - One-on-one interviews: 4 participants from each company. Up to 60 minutes per interview session.
    - Focus group discussion: 4 participants, requesting 2 from each company. Approximate time allocation of 75 minutes.

Participant eligibility background: With the company for most of the initial 5-year plus period of the HT venture as a co-founder, exec, and or individual contributor with visibility and decision-making in the sustainability of the venture in the formative years.

Participation criteria:

- Participation is voluntary and withdrawal can be at any time
- I will preserve participant confidentiality by anonymizing the participant using codes to distinguish information collected.
- I will meet with each (potential) participant to inform on the study and request participation. Accordingly, I will request an acknowledgment of the Informed Consent form, required by the Ethics board.
- I will not disclose Company identity in the study.
    - The signed letter of cooperation from the company leader enables company involvement and authorization for employees to participate of their own free will.
    - I will not collect any company business information.
- Interview and focus group protocol: audio-recorded sessions in a private (conference) room, with an interview session lasting up to 60 and the focus group session up to 75 minutes. Will follow-up with transcript review and member-checking (affirmation of researcher's interpretation).
- Sample Questions:
    - How do you define leadership skills required to support HT ventures during the first 5 years of operations?

    - What are the barriers to applying leadership skills to sustain HT ventures in the first 5 years of operations?
    - How did you address each barrier?
- Data collection period: I plan to complete data collection in October.
- Study findings: I will share the Abstract and a summary of the findings with the company and participants. When published in a scholarly journal (such as ProQuest), I will forward the study.

Thank you for your time,

Sincerely,

Zoaib
408-828-1438
zoaib.rangwala@waldenu.edu

Appendix J: Data Analysis Diagrams

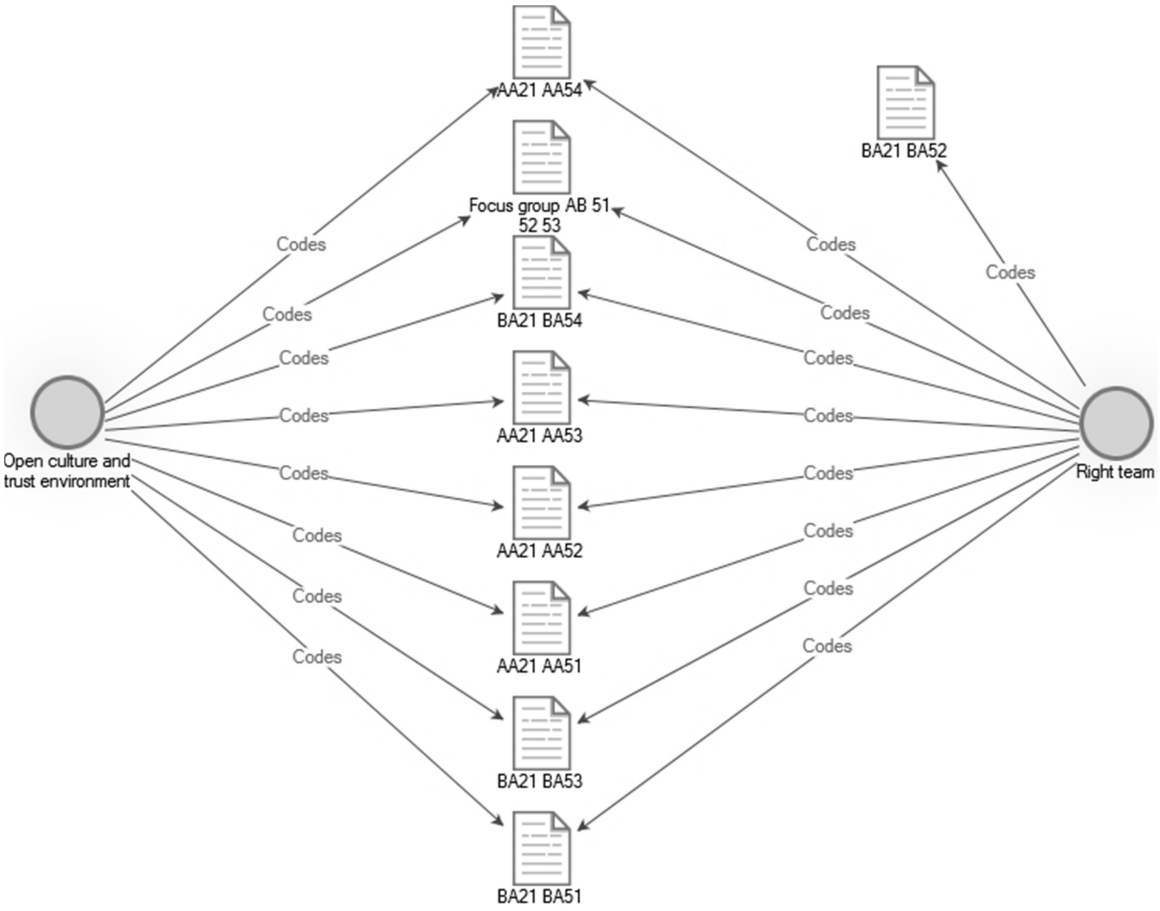


Figure 3. Comparison diagram showing the importance of the tandem themes of the right team and open culture and trust environment.

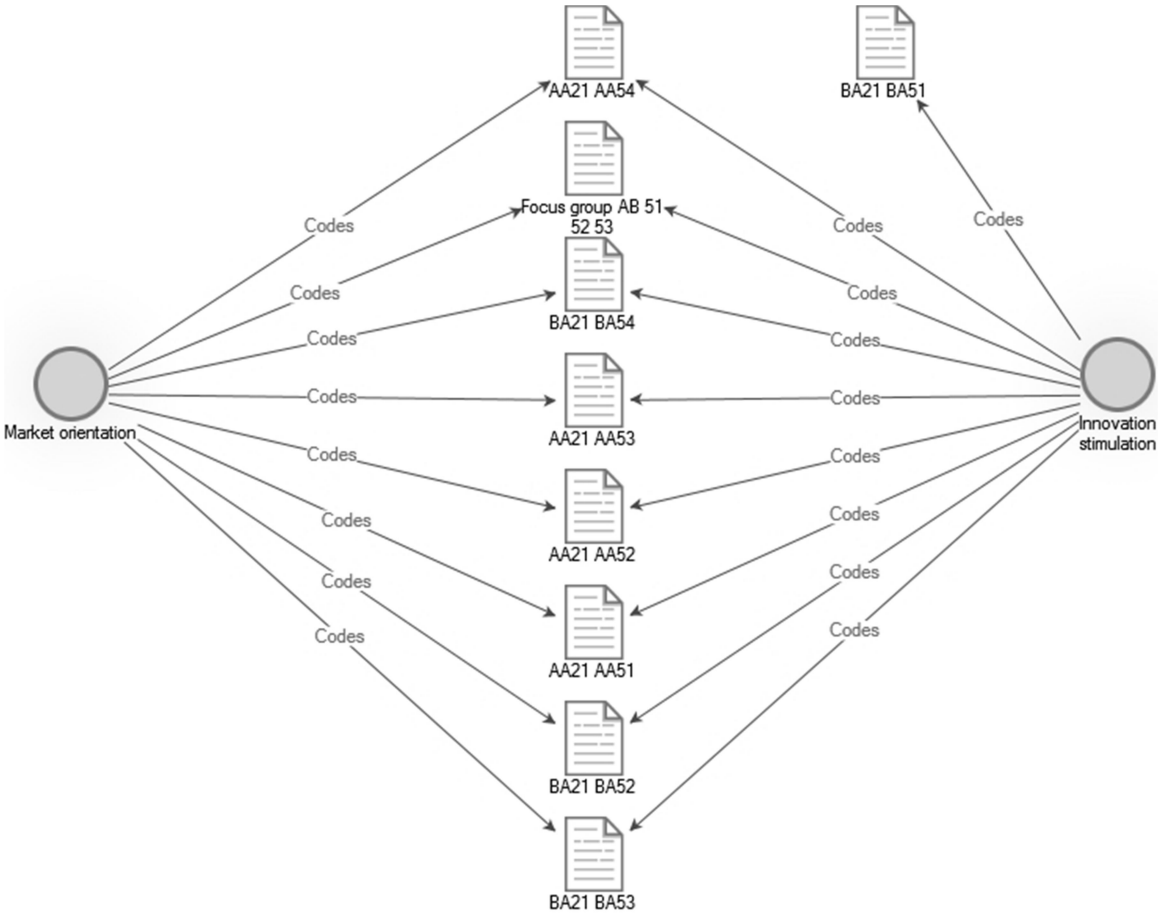


Figure 4. Comparison diagram depicting participants' viewpoint of the connectivity of market orientation and innovation stimulation themes.