

**MANAGEMENT AND LEADERSHIP OF INNOVATION
AND AMBIDEXTERITY IN THE INNOVATIVE HIGH-
PERFORMANCE ENTERPRISES IN THAILAND**


Hachapan Uachotikoon

**A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
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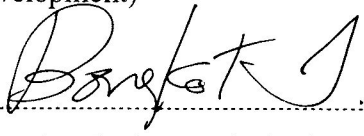
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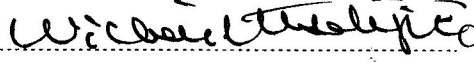
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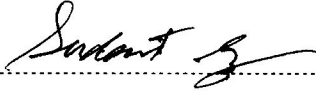
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ABSTRACT

Title of Dissertation	Management and Leadership of Innovation and Ambidexterity in the Innovative High-Performance Enterprises in Thailand
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To be innovative and high-performance are two opposing dimensions in organizations; one requires innovativeness, another, efficiency. Innovativeness and efficiency each requires a different and, often, contrasting set of capability and mentality; this causes paradoxes for organizations to manage along the way. *Ambidexterity* or the capabilities to maximize both dimensions is instrumental in managing the paradoxes. This research set out to study the organizations considered to be innovative and high-performance to explore the antecedent factors that enable ambidexterity in these organizations.

A multi-case study was opted as the research methodology to explore fifteen high-performance and innovative organizations; in-depth interviews were conducted with fifteen high-ranking executives, one from each organization. These organizations included three groups of company: 1) manufacturing corporations with over 100 innovation staff, 2) those with 51-100 innovation staff, and 3) IT/high-tech companies. The study sought out how these ambidextrous organizations manage and lead for both innovation and efficiency concurrently. The findings revealed six themes of the antecedents of ambidexterity: 1) separation and dynamics of structure, 2) strategic management, 3) systems, 4) project control procedures, 5) leadership, and 6) knowledge. Furthermore, the top-ten ranked antecedents were identified: 1) focusing corporate strategy on innovation and efficiency, 2) separated work unit for innovation,

3) setting directions for innovation, 4) up-front project feasibility screening, 5) timeline control, 6) management by committee, 7) budget control, 8) integration and cohesiveness of innovation management team, 9) innovation talent management, and 10) performance management system.

Incidentally, also identified in the research were seven themes of the antecedent factors of innovation, i.e. 1) structure, 2) system-process-tool, 3) staff, 4) human resource development and management, 5) leadership for innovation, 6) organizational climate and culture, 7) knowledge, and 8) environmental elements. Furthermore, The top-ten ranked antecedent factors of innovation were identified as follows: 1) support for opportunities and resources, 2) leaders showing passion and/or involvement in innovation, 3) cross-functional project teams, 4) functional expertise, 5) internal spatial separation of structure, 6) customer insight and market intelligence, 7) keeping pace with the latest technology, 8) technological changes as triggers for innovation, 9) flat structure, and 10) innovation as strategy and/or core-value.

The recommendation for practices proposed the following antecedent factors for organizations vying to be innovative and high-performance: 1) separation of structure for innovation, 2) alignment of explorative and exploitative functions, 3) ambidextrous strategic management, 4) scenario planning, 5) performance management systems, 6) talent management system, 7) project control procedures and tools, 8) separation of knowledge focus between management and frontline people, and 9) ambidextrous leadership.

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This has been a long, rocky, and testing journey; the end-result is rewarding though. Apart from the knowledge, I learned so many things during this PhD journey. I learned the real meaning of perseverance, hard work, hope and self-motivation. It dawned on me that great achievement is derived only through hard work, not by genius. Learning to take a small step at a time, persistently, would get one to arrive at the destination of any long journey, eventually.

So many people helped make this journey possible. First off, I would like to express my heart-felt gratitude to all the interviewees whose insights formed the valuable findings of the study, and many thanks to my friends and Brother who introduced me to many of the interviewees. Next up, I am very grateful to my great guide, resourceful and patient advisor, Associate Professor Dr. Wichai Utsahajit who gave me the best guidance, assistance and encouragement along the way. Also, I would like to thank my Committee for the valuable inputs for this dissertation. Next off, I am grateful to (Dr.) Korkiat Mahaveerachartkul, my PhD classmate, who actively helped correcting my dissertation format and then some. I also would like to thank the PhD program staff for their administrative assistance throughout the journey. Further appreciation goes to my PhD classmates for all the encouragements given to me. Importantly, I am grateful to Associate Professor Dr. Bung-on Sorod for the most encouraging words passed on to me right at the time when I was in the doldrums.

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Finally, a few words to my Dad up there, “I did it, Dad.”

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CHAPTER 1

INTRODUCTION

This study sets out to explore the management and leadership of innovation and the paradoxes of innovation vs. efficiency in the innovative and high-performance organizations (or iHPOs, in short) that have been officially recognized for their high performance and innovation. These companies will be the relevant organizations listed in the Stock Exchange of Thailand (SET) and the Market for Alternative Investment (MAI), or other organizations whose high business performance and innovation are evidently recognized.

The objectives of this research are 1) to study the structural and contextual factors that enhance innovation in iHPOs; 2) to find the typical paradoxes of innovation vs. efficiency; and 3) to seek out the ambidextrous management and leadership practices that maximize innovation and efficiency concurrently. This chapter gives an overview, rationale and the outline of the study.

1.1 Introduction

Amidst the turbulent and severe competition in the present business world, companies are competing head-on for their market shares, growth or survival, even. They strive to gain competitive advantage over their rivals in terms of product quality, cost, process efficiency, innovation, and customer responsiveness (Daft, 2015). These elements enable them to come up with better or newer product and service offerings to gain market shares or capture new markets. Nonetheless, products and services that are now new or disruptive will be duplicated by the competition and become commodities over time. Thus, continuously innovating and introducing disruptive new offerings to the market is imperative for company survival and growth (Christensen & Raynor, 2003). Given the short life cycles of new product offerings, innovativeness has become

a central issue for present-day competitive advantage and is regarded as an important organizational competency and a corporate strategy for firms to stay abreast and ahead of their competition (Amabile & Khaire, 2008; Drucker, 1985; McAdam & Keogh, 2004; Porter 1990). Furthermore, trends such as globalization, the knowledge economy and digital technologies have proved the very importance of innovation as such (Escriba'-Esteve & Montoro-Sa'nchez, 2012). Failing to innovate has cost businesses heavily; examples abound in recent business annals where inability to pursue new innovations brought about downfalls of gigantic multinational corporations, such as Kodak and Nokia, which were shoved out of their long-established businesses by disruptive innovations of digital cameras and smartphones respectively (Daft, 2015). Such incidents and the likes further illustrate the significance of innovation.

However organizational innovativeness needs a different skillset and a mindset from those enhancing efficiency. Thus, at times, implementing innovativeness in organizations might run counter to traditional efficiency management (March, 1991; Raisch & Birkinshaw, 2008; Smith, Sutherland, & Gilbert, 2017; Tushman & O'Reilly III, 1996). Therefore, it is worth an empirical study of the paradox of innovation and efficiency and its solutions; the paradox and solutions of which are known as ambidexterity. This notion leads to the ultimate purpose of this study which attempts to establish a pattern of management and leadership of ambidexterity.

1.2 Background of the Study

1.2.1 Innovation

Innovation is “the intentional introduction and application” of ideas, processes or procedures that are new and beneficial to an individual, a group, an organization, or wider society that adopts the innovation (West & Farr, 1990, p.9). Essentially, the innovation process is composed of two sequential stages: 1) the creation of new and novel ideas; and 2) the realization of the ideas into final outputs (Axtell, Holman, Unsworth, Wall, Waterson, & Harrington, 2000; Tidd & Bessant, 2009). From the component perspective, the innovation process basically consists of two elements: 1) creativity in the stage of idea generation; and 2) the implementation of the creative ideas in the latter stage (Amabile, 1997; Oldham & Cummings, 1996; Shalley & Zhou, 2008;

West & Farr, 1990). Although, in various academic literatures, the terms creativity and innovation are often used interchangeably, attempts have been made to clearly distinguish the two (Anderson, Dreu, & Nijstad, 2004; de Sousa, Pellissier, & Monteiro, 2012; Waite & Bogotch, 2017). In essence, the distinction of the terms is: creativity is considered the initial stage of innovation that centers around generation of novel and useful ideas, while innovation involves both the generation of such ideas and their implementation (Amabile, 1997; Mumford & Gustafson, 1988; West, 2002).

In any innovation process the outputs can be in the form of products or service, technologies, business models, work process, or management (Sengupta, 2014). And these innovation outputs can be typologically considered incremental, radical or disruptive according to their level of novelty and impact (Christensen & Raynor, 2003; Damanpour, 1991). In a classic typology by Schumpeter (1934), innovation refers to five things tangible or non-tangible: new products, new production methods, new markets, new sources of supply, and new industry structure (i.e. “the creation of a monopoly position”; “or the breaking up of a monopoly position” (Schumpeter, 1934, p.66). Or in a more contemporary and comprehensive classification, innovation is mapped into 10 categories, namely, profit model, network, structure, process, product performance, product system, service, channel, brand and customer experience (Keeley, Walters, Pikkell, & Quinn, 2013).

1.2.2 Factors Enhancing Innovation

In order to enable organizations to bring forth innovations, several factors have to be put in place to stimulate the antecedent innovativeness. Because innovativeness itself cannot be managed, organizations have only to manage the environment to set the stage for innovativeness, and hence innovation (Amabile & Khaire, 2008). The antecedent factors fall into structure-related category or context-related category (Daft, 2015), which can be elaborately grouped into 9 dimensions: organizational structure, technology, innovation process, corporate strategy, corporate culture, workforce, resources, knowledge management, management style and leadership (Smith, Busi, Ball, & Van der Meer, 2008). In closer studies of the contextual factors that enable workplace innovation, several management and leadership roles were uncovered. The findings suggest that leaders must spearhead to solidify these following contextual

elements in the organizations: collaboration, collective creativity, shared vision, bottom-up and horizontal communication, boundary spanning, customer and market insight, innovation process, data-driven decision making, trust, openness, encouragement and support, slack resources, risk taking, freedom and autonomy (Amabile, 1988; Amabile & Khaire, 2008; Hill, Brandeau, Truelove, & Lineback, 2014; Isaksen, 2017; Madjar & Ortiz-Walters, 2008; Smith et al., 2008). In terms of organizational design, the following elements are believed to facilitate innovation: flat organization, cross-functional teams, flexibility, organic organization, team member diversity, and learning organization, to name but a few (Benner & Tushman, 2003; Daft, 2015; Mintzberg, 1979).

1.2.3 Paradoxes of Innovation vs. Efficiency

Over the past 40-50 years, businesses have been building up competencies that enhance efficiency, which are firmly established in organization management principles and practices (Sarri, Bakouros, & Petridou, 2010). However, an innovation-driven organization needs a skillset, a mindset and antecedent factors different from those of an efficiency-driven organization (March, 1991; Raisch & Birkinshaw, 2008; Smith et al, 2017; Tushman & O'Reilly III, 1996). In the attempts to enhance efficiency and quality, creativity itself may impede the expected performance outcomes because efficiency is derived from utilizing the least input such as time, budget and other resources to produce the most possible output, rather than spending time and resources on experimentation of new ideas; while, in like manner, quality requires rule abiding and standardization, rather than freedom to break away from the rules which is embedded in the nature of creativity (Buttner & Gyskiewicz, 1993; Kirton, 1976; Levitt, 2002; Oldham & Cummings, 1996;). Introducing into organizations the factors that enhance innovation may, at times, run counter to efficiency-driven practices that organizations have been faithfully operating by. For instance, according to Amabile, Conti, Coon, Lazenby, and Herron (1996), autonomy and freedom are posited as the elements that enhance creativity and innovation, but these factors are fundamentally in direct contradiction with the elements of system and control which are key to managing efficiency (Daft, 2015; Hurst, 1995). Likewise, Isaksen (2017) proposes playfulness and humor, idea time, and risk taking as the elements that promote creativity. Again,

these elements do not go hand in hand with those that enhance efficiency, such as goal attainment or budgeting (Lewin & Stephens, 1994). And structure-wise, flat organizational structure facilitates innovation (Cohendet & Simon 2007; Jung, Wu & Chow, 2008), whereas efficiency requires vertical structure for command and control (Daft, 2015; Hurst, 1995). These are the contradictions and paradoxes that organizations must encounter, embrace and overcome, because leaning toward either innovation or efficiency has proved fatal to enterprises—big or small (Raisch & Birkinshaw, 2008; Tushman & O'Reilly III, 1996). Studies find that 84% of new startups did not survive their infancy period due to their orientation toward only innovation, neglecting to develop efficiency in the operational process (Land & Jarman, 1993). More recent statistic supports these findings, claiming 8 out of 10 startups fail within their first three years (Feinleib, 2011); and even in the small business sector, the latest 2018 statistic reveals as high as 50% of small businesses in USA failed within their first five years (U.S. Small Business Administration, 2018). On the other hand, as afore-mentioned, the gigantic multinational enterprises, such as Kodak, Nokia, etc. collapsed because of their orientation toward efficiency, neglecting sufficient innovativeness that could have brought about new innovations to cope with new trends in the global market (Daft, 2015). Studies illuminate that both innovation and efficiency are prerequisite for organization survival and success in the short and long terms (Gibson & Birkinshaw, 2004; He & Wong, 2004; March, 1991; O'Reilly III & Tushman, 2004; Raisch & Birkinshaw, 2008; Tushman & O'Reilly III, 1996). In the recent decades, scholars have proposed integrated frameworks for organizations to manage the paradoxes of innovation and efficiency in order to maximize organizational performance from both dimensions concurrently. They named these organizations “ambidextrous organizations” (Tushman & O'Reilly III, 1996, p. 24), and the quality of being ambidextrous “organizational ambidexterity” (Raisch & Birkinshaw, 2008, p. 375).

1.2.4 Management and Leadership of Ambidexterity

To be ambidextrous, organization management must cope with the conflicting demands of both innovation and efficiency in such a way that maximize the benefits of each of these dimensions concurrently, not to trade one off for another, nor just to compromise the conflicts for middle ground (Andriopoulos & Lewis, 2009; Gupta, Smith, & Shalley, 2006; Smith et al, 2017). In early studies, separation of organization structure was put forth as the solutions to enhance ambidexterity (Tushman & O'Reilly III, 1996), while later research focused more on the contextual aspects of organizations. (Gibson & Birkinshaw, 2004).

Following are some of the major paradoxical factors of ambidexterity that need intervention from leaders and management who are attempting to build innovativeness in their organizations.

1) First and foremost, explorative and exploitative learning (March, 1991): Explorative learning (also known as exploration) is about creating new knowledge, while exploitative learning (or exploitation) is about utilizing existing knowledge. Exploration is associated with activities such as, searching, experimenting, and risk taking etc., these result in discovery of new knowledge; while exploitation is about such activities as refinement, selection, implementation that result in organizational efficiency (March, 1991).

2) Autonomy and control (Bledow, Frese, Anderson, Erez, & Farr, 2009): Autonomy is about decentralization of authority to create autonomy for the work teams (Shalley, Zhou, & Oldham, 2004), while control is about the centralization of authority to maximize efficiency (Keller, 2006).

3) Incremental and radical innovation: Incremental innovation is the minor change in existing products, operational processes and business concepts, while radical innovation is the fundamental change departing from existing products, processes or management concepts (Abernathy & Clark, 1985; Chandy, Chandy, & Tellis, 1998; Benner & Tushman, 2003).

4) Continuity or status quo and change: Continuity or status quo is the continuation of the existing stage and the stability, while change is the periodic renewal of organizations (Brown & Eisenhardt, 1997; Leana & Barry, 2000; Probst & Raisch, 2005; Tushman & Romanelli, 1985; Volberda, 1996). There needs to be a good balance

of these two elements because if organizations execute too frequent or too drastic a change, confusion could arise among the workforce. Nonetheless on the flip side, persistently maintaining continuity or the status quo could cause inertia to the business (Huy, 2002; Levinthal & March, 1993; O'Reilly III, Harrel, & Tushman, 2009; Papachroni, Heracleous, & Paroutis, 2015; Sastry, 1997; Volberda, 1996).

5) Affirming the individual and the group (Amabile & Khaire, 2008; Hill, 2000; Hill et al., 2014): Innovation process is a group activity requiring different complimentary abilities, points of view and collaboration from members of the group. Whereas creative individuals need independence and engagement, emotional space and solitude to create their best work (Hill, 2000; Hill et al., 2014). Ambidextrous organizations need to balance this paradox well to maximize individual creativity and group innovation.

6) Top-down and bottom up knowledge inflows: Top-down knowledge inflows are related to exploitation, while bottom-up knowledge inflows from peers and followers enhance exploration. The higher the activities of both channels, the higher the levels of exploration and exploitation. (Mom, van den Bosch, & Volberda, 2007).

7) Mechanistic and organic structure: Mechanistic structure represents standardization, centralization and hierarchy which facilitate efficiency; whereas organic structure relies on decentralization and autonomy which enhance flexibility, hence innovation (Benner & Tushman, 2003; Burns & Stalker, 1961; Daft, 2015; Mintzberg, 1979).

Afore-mentioned is a non-exhaustive list of contradictory requisites for embracing both innovativeness and efficiency in an organization. At the time when every business and social sector is vying for innovativeness and innovative organizations, it is of utmost importance for organizations to not neglect to balance innovativeness with efficiency or, in other words, to pursue ambidexterity management and ambidextrous leadership practices. This would enable organizations to prosper and sustain over time, and eventually last long into the future even after this fervent rush for innovation is well over.

1.3 Problem Statement

In this era of Thailand 4.0, industries are urged to move towards innovation-based businesses, not limited to just digital innovation but all forms of innovative products that utilize creativity and innovation (NESD, 2017). Organizations are awakened to look into their own innovativeness to enhance it or to build it up in case of the absence of such. In becoming an innovative organization, leaders and the management need to establish a new and different skill set, mindset and organizational factors that depart from what they are used to up till now (March, 1991; Raisch & Birkinshaw, 2008; Tushman & O'Reilly III 1996). And some aspects even collide head on with traditional practices and culture that organizations have been immersed in all along (Andriopoulos & Lewis, 2009; Gupta et al., 2006; Smith et al., 2017). This poses a dilemma for organizations striving to be innovative on the very platform that has been built for efficiency, cost and quality (Daft, 2015; Miron, Erez, & Naveh, 2004). Again, from a different perspective, new startups would spring up into the business world wielding their new and unique innovative products that can demand skimming prices. However, before long, competitors would barrel along from behind with the equivalent product offerings which poses serious competition to the incumbents and which could spark a price war. It is then that competitiveness in terms of pricing, quality and reliability would kick in, and efficiency and operational excellence must come into play (Tidd & Bessant, 2009). These scenarios are when ability to lead and manage paradoxes of innovation and efficiency counts and matters.

This research plans to study iHPOs of SET and MAI or other well-regarded companies for innovation and proven high performance to unearth the pattern they lead and manage for innovation, efficiency and the paradoxes that accompany, so as to present a framework for ambidextrous management and leadership as a roadmap for those who will be travelling down this road of innovation and ambidexterity.

1.4 Purpose of the Study

This study aims to shed light on the management and leadership of innovation, its paradoxes, and the solutions to the paradoxes. The purpose of this study are as follows:

- 1) To explore the management and leadership of innovation.
- 2) To explore the paradoxes of innovation and efficiency.
- 3) To come up with solutions to the paradoxes.
- 4) To propose a conceptual framework of management practices and leadership for innovation and ambidexterity.

1.5 Research Questions

The research questions of this study are as follows:

- 1) What are the structure, context, culture that enhance innovation in innovative and high-performance organizations?
- 2) What are the paradoxes encountered and overcome in achieving both innovativeness and efficiency (ambidexterity)?
- 3) How do these organizations manage for ambidexterity (innovation and efficiency)?
- 4) What is a possible ambidextrous model of innovative high-performance organizations in Thailand?

1.6 Research Scope

This study is to explore the organizational elements, the management and leadership practices that would enhance both innovation and efficiency in iHPOs. A qualitative approach will be used in this study to inductively find out what and how of the management and leadership for innovation and efficiency in iHPOs; it is believed that a qualitative approach can bring depth and richness to a study (Conger & Toegel 2002; Zheng, Khoury, & Grobmeier, 2010). And case-study, in particular, is highly regarded as an investigation that can elicit an individual's perception regarding a

phenomenon in a given situation (Yin, 2009). Therefore, case study research will be used as the research methodology that could aptly serve the purpose of this study.

1.6.1 Methods

In-depth interviews and non-participant observations will be used as the main methods for data collection. In-depth interview is used because of its in-depth conversational style that can uncover thoughts and feelings of interviewees at a deeper level (Fraenkel & Wallen, 2003). And observation is best for collection of data emerging in natural setting (Creswell, 2013). The observation will also serve as a triangulation tool (Merriam, 1998) against data from interviews; and used for collecting data of the physical structure, work climate and visible cultural artifacts.

1.6.2 Content Analysis

Content analysis of the interviews transcription and the observation memo will be carried out and open coding for each meaningful expression is to be generated from the transcripts independently. Codes will then be grouped into categories with conceptual similarity, from which themes will be eventually generated (Glesne, 2011). The codes and themes are to be compared with the findings from the observation for triangulation.

1.6.3 Sample

Sample organizations will be selected from a group of listed companies in Thailand SET and MAI, who appear in both the High-Performance Companies list and Innovative Companies list, thus are officially recognized as innovative and high-performance companies. Fifteen such companies will be selected as participants for this study. At least one senior management from each company will be interviewed in-depth for a session of 60-90 minutes. And preferably, if possible, one more middle management each is to sit in another separate interview. In total 15-30 in-depth interviews will be carried out throughout the whole study.

In case the number of companies that agree to participate in the interview are less than the target, the list of companies will expand to include those outside of the

Thailand SET and MAI who are well-regarded as innovative and show tangible evidence of having high-performance

1.7 Significance of the Research

Firms need new products or new product features to maintain or capture new market shares, while at the same time must be efficient in order to offer quality at low cost to be competitive in the market (Daft, 2015; Porter, 1990). However, to be simultaneously innovative and efficient often requires different sets of supporting elements, which at times contradict one another. The findings in an organizational ambidexterity research would offer good insights to the organizing of both concurrent aspects. Entrepreneurial start-ups will benefit from the insights in bringing themselves through the start-up infancy period and add efficiency to the work process in the later stage of growth. Likewise, high performance organizations that need to add innovation capacity to their competency portfolio will also benefit from the insights that will serve as a guideline to manage innovation, which often requires different organizational elements, skill set and mindset of all involved.

1.8 Operational Definitions of Key Terms

There are some key terms used throughout this study that need clarification so as to delineate the definition specific to this study.

1.8.1 Creativity and Innovation

Amabile (1997), together with many other scholars defines creativity as the ability to generate novel and useful ideas. Creativity is the first of the two innovation process, while innovation is the production of such novel and useful ideas, and their implementation and realization into final outputs (Amabile, 1997; Oldham & Cummings, 1996; Shalley & Zhou, 2008; West & Farr, 1990).

In this study, creativity is considered the initial stage of innovation that centers on generation of novel and useful ideas, while innovation involves both the generation of the ideas and their implementation (Amabile, 1997; Mumford & Gustafson, 1988;

West, 2002). On top of 1) the first meaning above, this study also refers to innovation as 2) the output from the innovation process, and 3) the innovation process itself.

1.8.2 Incremental Innovation, Radical Innovation and Disruptive Innovation

Innovation can be classified according to its novelty and impact. Incremental innovation refers to minor changes or improvements to the existing products or processes, which result in increases in eventual organizational efficiency. Radical innovation refers to drastic change that makes the innovation new to the world (Romijn, & Albaladejo, 2002; Tidd & Bessant, 2009). Disruptive innovation refers to the type of innovation, mainly in the form of products, that substitutes the existing products, creates new market and even causes the incumbent products to exit the market (Christensen & Raynor, 2003).

1.8.3 Exploration vs. Exploitation

“Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution” (March, 1991, p. 71). Both types of activity enhance organizational learning and prosperity. However, both activities include inherent contradicting demands that must be balanced (Tushman & O’Reilly III, 1996). Earlier on, scholars focused on the narrow sense of March’s concept to emphasize creation of new knowledge versus refinement of existing knowledge (Levinthal & March, 1993). Subsequent studies have shifted to apply the concept to a wider scope that includes various manifestations of diversity, diversification, search, variation, risk taking, experimentation, strategic competency building and innovation on the one hand, organizational focus, experience, selection, refinement and competency leveraging, variance reduction, on the other (Lavie, Stettner, & Tushman, 2010; Raisch & Birkinshaw, 2008).

In short, exploration is the creation of new knowledge, new learning, which is closely related to innovation, while exploitation is the utilization of existing knowledge which is related to efficiency, productivity, performance, cost and quality.

1.8.4 Innovation Paradoxes

An innovation paradox refers to the state of conflict caused by conflicting demands between elements of innovation and efficiency (or exploration vs. exploitation) (Andriopoulos & Lewis, 2009; Raisch & Birkinshaw, 2008).

In this research this paradox refers specifically to the conflicting demands of innovation and efficiency; radical innovation and incremental innovation; exploration and exploitation.

1.8.5 Efficiency

Efficiency is derived from utilizing the least input such as time, budget and other resources to produce the most possible output rather than spending time and resources on experimentation of new ideas; while, by the same token, quality requires rule abiding and standardization, rather than freedom to break the rules (Buttner & Gyskiewicz, 1993; Kirton, 1976; Levitt, 2002; Oldham & Cummings, 1996;). In this research efficiency refers to process efficiency, work efficiency, work performance, minimal cost, product and service quality. These terms may be used interchangeably to suit the contexts.

1.8.6 Ambidexterity

The ability to excel at these conflicting demands of innovation (i.e. innovation vs. efficiency; exploration vs. exploitation) is called ambidexterity (Andriopoulos & Lewis, 2009); the organization with this ability is called ambidextrous organization and the leadership, ambidextrous leadership.

1.8.7 Small and Medium-Sized Enterprises (SMEs)

According to The Office of Small and Medium Enterprises Promotion in Thailand (OSMEP), small and medium-sized enterprises are the companies with fixed asset values under 200 million Baht. In more detailed definitions, those identified as medium enterprises owns between 50-200 million Baht of fixed assets; while small enterprises are those owning less than 50 million Baht of fixed assets (OSMEP, 2014). In contrast, the SMEs listed on Market for Alternate Investment of Thailand (MAI) are

identified by their shareholder's equity of between 50-300 million Baht and are in a stable and healthy financial condition with at least 3 years of good track record.

This research opts for MAI's definition of SME and will use SMEs listed on MAI as the samples of study (together with some other listed companies on Security Exchange of Thailand (SET)).

1.8.8 Management

According to Kotter (1990), Yukl (2009) and Zaleznik (2004), management is the organizational function that allocates scarce resources against an organization's objective, sets priorities and timeline, engages in the designs of work, sets standards, develops and maintains a smooth functioning workplace; all for the achievement of agreed results. Management essentially consists of controlling resources, people and entities to accomplish a goal.

In this research, management refers to the control, utilization and arrangement of all organizational resources, structure and systems to achieve corporate objectives.

1.8.9 Leadership

According to Kotter (1990), Yukl (2009) and Zaleznik (2004), leadership refers to an individual's ability to provide a sense of direction, review the big picture, create a shared vision, align people, influence, motivate, facilitate individual and collective efforts to accomplish the shared objectives and cope with changes.

In this research, leadership refers to a leader's ability, mental model, attitude, skills, behaviors and actions that motivate, inspire and facilitate individual and collective efforts to achieve shared objectives.

1.9 Author's Background Related to This Topic

I have been in the business circle for over 40 years, as both an entrepreneur and professional executive in private and public companies. My educational background is in non-STEM discipline. However, my management background is dominantly in the realm of marketing and sales, where I was heavily involved with creativity. Furthermore, the products in my line of work have kept me exposed to innovation; these

products include personal computers, music and movies in digital medium (i.e. Laser Discs, CDs, DVDs), and lastly, automobiles. These industries involve all types of technological changes and innovation—be it incremental, radical or disruptive. In the latter half of my career, my job function expanded to cover general management, responsible for corporate performance as a whole. This is when not only had I to deal with creativity and innovations but also to care for operational efficiency and corporate excellence as well. There were times I was caught between a rock and a hard place in solving the paradoxes of short and long-term benefits, innovativeness and efficiency, and often times I was at sea, not knowing what the best solutions for the paradoxes were, just simply shot from the hip and managed by the seat of my pants.

Apart from my own direct experience, I also witnessed the rise and fall of several businesses, thanks to inability to manage innovation or the conflicting demands of innovation and efficiency. I also witnessed successful startups, both tech and non-tech businesses, who thrived on innovation at the initial phase and glided through the growth phase, got the operational process in place and finally established themselves as a force to reckon with in their fields, after dozens of years and counting.

These experiences get me pondering for the patterns of management and leadership in the successful companies, that enable them to survive and prosper in the face of ever-changing innovation landscape and the VUCA (volatility, uncertainty, complexity and ambiguity) environment. It is very intriguing to get to find out what they have and do to enhance innovativeness; what efficiency enhancing program they undergo; what obstacles they encounter; what ambidextrous paradoxes they solve and how. All these questions have been high on my agenda from my day one on this PhD course. I would be very thrilled to be able to find out whatsoever at the end of this research as to what ambidexterity these organizations have in common that have been keeping them going strong all through these years.

1.10 Dissertation Outline

This dissertation is comprised of five chapters. Chapter one is the introduction providing overview of the study, including the rationale and a problem statement, research questions and the significance of the study.

Chapter two is the literature review of the concept of innovation, the innovation paradoxes, ambidexterity, ambidextrous organization, its management and leadership, and the conceptual framework of this dissertation.

Chapter three is the research methodology outlining the research design, the description of qualitative study utilized in this study, followed by sampling procedures, selection criteria of participants, data collection and the analysis procedures.

Chapter four presents data analysis and the result.

Chapter five is the discussion and conclusion of this research, together with the application of the findings and the research limitation and suggestion.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to formulate a conceptual framework for ambidextrous management and leadership by way of review of literatures on the related issues of explorative innovation and exploitative innovation, the paradoxes of innovation-efficiency, and eventually, organizational ambidexterity and the management and leadership.

2.1 Overview of Innovation

Since the main focus of this research is on ambidexterity management of innovative high-performance organizations (iHPOs), this section will present a very brief review of relevant points on innovation that would set the stage for the upcoming section of organizational ambidexterity.

2.1.1 Definition of Innovation

Innovation is “the intentional introduction and application” of ideas, processes or procedures that are new and beneficial to an individual, a group, an organization, or a wider society that adopts the innovation (West & Farr, 1990, p.9). It is “a process of turning opportunity into new ideas and of putting these into widely used practice” (Tidd & Bessant, 2009, p. 16). Innovation is considered the foundation of entrepreneurship in enterprises, be it large or small, and is rightly the means to create new organizational wealth or enable existing resources to create further wealth. (Drucker, 1985), and it contributes to organizational competitiveness and success (Amar, 2004; McAdam & Keogh, 2004). Prominent scholars in the realms of management, strategy and innovation studies, such as Porter (1990), Christensen and Raynor (2003), Amabile and Khaire (2008), Kanter (1988), McGrath (2001), etc., all sing the same tune, confirming

innovation as a competitive advantage for organizations to survive and prosper.

In various literatures on innovation, one will often find the term creativity appear together with innovation, and in many occasions, it seems these two terms are even used interchangeably. However, scholars have rightfully put efforts to clearly distinguish the two terms (Anderson, de Dreu, & Nijstad, 2004; de Sousa, Pellissier, & Monteiro, 2012; Waite & Bogotch, 2017). In essence, the distinction of the terms is made as follows: creativity is considered the initial stage of innovation that centers around generation of novel and useful ideas, while innovation involves both the generation of such ideas and their implementation (Amabile, 1997; Mumford & Gustafson, 1988; West, 2002).

2.1.2 Components of Innovation Process

The innovation process essentially consists of two sequential stages: 1) the creation of new and novel ideas and 2) the realization of the ideas into final outputs (Axtell et al., 2000; Tidd, & Bessant, 2009). And again, if considered from its components, the innovation process is basically composed of two elements: 1) creativity in the first stage of idea generation; and 2) implementation of the creative ideas in the latter stage (Amabile, 1997; Anderson, Potočnik, & Zhou, 2014; Oldham & Cummings, 1996; Shalley & Zhou, 2008; West & Farr, 1990).

2.1.3 Typologies of Innovation

Innovation can be generally classified as administrative and technological, and product and process related (Damanpour, 1991). In a classic typology by Schumpeter (1934), innovation is classified into five categories: new products, new production methods, new markets, new sources of supply, and new forms of organization. In a more recent study, innovation outputs can be classified as products or service, technologies, business models, work process, or management process (Sengupta, 2014). Yet in a contemporary, comprehensive and relatively all-encompassing typology, innovation is classified into 10 categories, namely, 1) business model innovation by which one finds new ways to deliver profits; 2) interorganizational network innovation through which one can utilize innovation from other organizations; 3) structure innovation in which an organization can find new unorthodox means of

making fuller use of its resources; 4) process innovation in which new activities and operations for production of product offerings are employed; 5) product performance innovation which enhances performance of a company's product by an entirely new product or improved product features; 6) product system innovation which bundles individual products and services to captivate, delight customers and fend off competition; 7) service innovation which enhances the value of a product offering; 8) channel innovation through which customers can gain access to products and services with more ease and convenience; 9) brand innovation which ensures customers' recognition and preference for an organization's product offerings; and 10) customer experience and engagement innovation through which meaningful connections between customers and an organization are developed (Keely, Walters, Pikkell, & Quinn, 2013).

Further to the above typologies, there is yet another important classification which is based on novelty and impact of the innovation. This typology classifies innovation into two categories: radical and incremental innovation (Damanpour, 1991; Nord & Tucker, 1987; Tidd & Bessant, 2009; Tushman & Anderson 1986). According to these scholars, radical innovation is the type of innovation that brings forth new product offerings, processes or new markets, by utilizing knowledge new to the organization. In contrast, incremental innovation is the improvement of existing product offerings and processes, by utilizing the existing organizational knowledge. This typology plays a key role in investigating the management of organizational ambidexterity which is central to the purpose of this study.

Radical innovation comes in various forms and are called by various names. For example, it can be called disruptive innovation, when the new innovation replaces the old one and drives incumbents out of the market (Christensen & Raynor, 2003), or competency destroying innovation, when new competency is needed to create the innovation (Tushman & Anderson, 1986); or it can be discontinuous innovation, when it replaces and puts an end to the existing product, process or technology (Tidd & Bessant, 2009). The denotation of all the terms signifies the utilization of new knowledge in producing and using radical innovation (Damanpour, 1991; March, 1991; Tidd & Bessant, 2009; Tushman & Anderson 1986).

2.1.4 Antecedent Factors Enhancing Innovation

In general, the path of innovation from ideas to implementation is composed of stages of idea generation, idea evaluation and selection, idea mobilization, product prototyping, finalization of the product, and launching and marketing of the finalized product. It is along this path that innovativeness needs to be enhanced in order to facilitate the innovation process (Amabile, 1988; Bledow, Frese, Anderson, Erez, & Farr, 2009; Rothwell, 1992; West, 2002). However, it has been posited that innovativeness itself cannot be directly managed, organizations have only to manage the environment to set the stage for innovativeness, and hence indirectly influence innovation (Amabile, 1988; Amabile & Khaire, 2008; Amabile et al., 1996; Shalley et al. 2004; Woodman, Sawyer, & Griffin, 1993; Zhou & Shalley, 2003). One recognized approach of studies on innovation is to look at antecedent factors from multilevel perspective i.e. individual, team and organization levels (Anderson, Potočnik, & Zhou, 2014; Hitt, Miller, & Colella, 2006; Woodman et al., 1993). Yet other researchers look at the antecedents as 1) individual employee characteristics; and 2) the work climate or work environment that the employee work in. This stream of research distinguishes between factors that is innate in the employees which have little room for external influencing, and the work environment which can be strongly influenced by management at all levels (Amabile, 1997; Amabile et al., 1996; Sternberg & Lubart, 1999). For the clear picture of what management can and cannot intervene to influence innovativeness, this review will look at the antecedent factors with the latter perspective which classifies the factors into two categories: employee creative characteristics and work environment.

2.1.4.1 Employee Creative Characteristics

Antecedent factors of innovativeness at the employee level are dominantly related to traits, values and thinking style, self-concepts and identity, knowledge and abilities and psychological state (Anderson et al., 2014; Sternberg & Lubart, 1999). These elements are arranged in two antecedent factors as follows:

Antecedent factor 1: Knowledge and creativity skills. This factor refers to the knowledge, expertise and skills for creativity as follows: 1) domain related expertise and knowledge (Amabile, 1997; Dewar & Dutton, 1986; Woodman et al., 1993); 2) creativity skills: divergent thinking (Amabile, 1997; Kirton, 1989; Woodman

et al., 1993), ideational fluency, ability to connect ideas, seeing similarities and differences, (Barron & Harrington, 1981), being inquisitive, questioning status quo (Jolly, 2008).

Antecedent factor 2: Psychological states and attitudes. This is about the personalities and affective elements of an innovative individual, which includes such elements as: 1) intrinsic task motivation (Amabile, 1997; Sternberg, 1985; Woodman et al., 1993); 2) openness to experience personality (Baer, 2010; McCrae, 1987); 3) proactive personality (Gong, Cheung, Wang, & Huang, 2012); 4) self-efficacy (Tierney & Farmer, 2011); 5) self-esteem (Woodman et al., 1993); 6) tolerance of ambiguity (Amabile, 1997; Ford, 1996; Janssen, 2005; Unsworth & Clegg, 2010); and 7) social networking ability (Baer, 2012). Obviously, as mentioned earlier, most of these factors are inborn and embedded in each individual employee during early stages of life, well before joining the organizations and are beyond the intervention by the management. Therefore, organizations can but look for these individual characteristics during the processes of recruitment and selection (Loewenberger, 2013; Waples, Friedrich, & Shelton, 2011).

2.1.4.2 Work Environment

As for the antecedent factors in the work environment, extant studies have identified various elements at the team and organization levels that enhance workplace innovativeness. These elements are arranged into 10 antecedent factors of innovation as follows:

Antecedent factor 1: Corporate strategy and shared vision. The sub-factors are: 1) a clearly articulated shared vision (Brown & Eisenhardt, 1995; Garcia-Morales, Llorens-Montes, & Verdú-Jover, 2006); top management commitment (Calantone, Cavusgil, & Zhao, 2002; Rothwell, 1992); stretching strategic intent (Hamel & Pahalad, 2005); 2) dissemination of the strategic vision throughout the relevant organization (Brown & Eisenhardt, 1995); and 3) team-based structure (Brown & Eisenhardt, 1995; Rothwell, 1992; Thamhain, 1990).

Antecedent factor 2: Organizational design. The sub-factors are: 1) flat structure (Daft, 2015; Smith et al., 2017); 2) decentralization; low formalization; high degree of specialization of each personnel in his/her respective function (Daft, 2015; Subramanian & Nilakanta, 1996); 3) corporate flexibility and responsiveness to change

(Daft, 2015; Rothwell, 1992); and 4) team member diversity (Woodman et al., 1993).

Antecedent factor 3: Organizational creativity climate and culture. Climate refers to the shared perceptions among workforce members regarding organizational policies, practices, and procedures as well as the behaviors that are rewarded, supported, and expected at work, whereas Culture refers to shared values, norms, or beliefs underpinning the customary ways things are done in organizations (Anderson & West 1998; Ehrhart, Schneider, & Macey, 2013; Schein, 2010). Climate differs from culture in that it is more observable, and more easily managed, changed or improved (Tidd & Bessant, 2009). The sub-factors of this antecedent factor are: 1) high involvement in innovation organization-wide (Rothwell, 1992; Tidd & Bessant, 2009); 2) participative safety (Anderson & West, 1998); 3) absence of over-workload; 4) absence of organizational impediments (i.e. internal politics, harsh criticism of new ideas, destructive internal competition, risk avoiding, clinging to status quo) (Amabile, 1997); 5) organizational and supervisory encouragement; (Amabile, 1997; Anderson & West, 1998; Isaksen, 2017); 6) work group support; 7) freedom, work autonomy, empowerment (Amabile, 1997; Amar, 2004; Daft, 2015; Isaksen, 2017); 8) challenging work (Amabile, 1997; Amar, 2004; Isaksen, 2017); 9) trust and openness; 7) playfulness, humor (Isaksen, 2017); 10) orientation toward risk, risk-taking (Amabile, 1997; García-Granero, Llopis, Fernández-Mesa, & Alegre, 2015; Isaksen, 2017; Rothwell, 1992); 11) recognition, and rewards as bonus; 12) performance feedback (Amabile, 1997; Amar, 2004; George & Zhou, 2001); 13) collaboration; communication across an organization; and 14) debate (Cummings & O'Connell, 1978; Hyland & Beckett, 2005; Isaksen, 2017).

Antecedent factor 4: Knowledge. The sub-factors are: 1) knowledge management (Amar, 2004; Lemon & Sahota, 2004; Pavitt, 2002); 2) learning organization; 3) utilization of both internal and external knowledge for innovation management (Rothwell, 1992); 4) information and knowledge sharing (Amar, 2004; Calantone et al., 2002; Lemon & Sahota, 2004; Pavitt, 2002); 5) long term commitment to training and development, and human capital development (Rothwell, 1992; Smith et al., 2008; Tidd & Bessant, 2009; Yukl, 2009); 6) networking with external sources of know-how and information; and 7) customer and market insights (Rothwell, 1992).

Antecedent factor 5: Resources. The sub-factors are: 1) sufficient and

slack resources (Amabile, 1997); and 2) planning and management of financial resources, human resources, physical space to facilitate innovation (Knight, 1987; Nohria & Gulati, 1996; Subramanian & Nilakanta, 1996).

Antecedent factor 6: Technology. The sub-factors are: 1) utilizing technology for knowledge management (Sorensen & Stuart, 2000; Kandampully, 2002); 2) utilizing technology for innovation management and to facilitate innovative behavior within and among organizations (Loewe & Dominiquini, 2006; Petroni, 1998; Watts, Swann, & Pandit, 1998); and 3) technological skills and the education. (Smith et al., 2008).

Antecedent factor 7: Innovation process. The sub-factors are: idea generation, selection and evaluation techniques, implementation mechanism (Amabile, 1988; Bledow et al., 2009; Vandermerwe, 1987).

Antecedent factor 8: Workgroup process. The sub-factors are: 1) group norms (Hill, 2014; Woodman et al., 1993); 2) group cohesiveness; 3) intra-team advice, feedback and collaboration; and 4) conflict management (Cummings & O'Connell, 1978; Woodman et al., 1993).

Antecedent factor 9: Management and leadership. The sub-factors are: 1) participative and empowering management style (Smith et al., 2017); 2) clear project vision, powerful product concept (Brown & Eisenhardt, 1995); 3) orientation toward task excellence and quality (Anderson & West, 1998); 4) motivating employees to innovate (Amar, 2004); 5) risk taking; 6) visioning; 7) leveraging opportunity; 8) adaptation; 9) coordination of information flow; 10) facilitation; 11) open-mindedness; 12) being an appreciative listener; 13) enabling collaboration and combatting the lone inventor misbelief; 14) managing diversity in teams to benefit innovation; 15) tapping ideas from all ranks across organizations; 16) using metaphors, analogies, and stories to help teams conceptualize together; 17) willingness to take on external ideas; 18) encouraging individuals to gain diverse experiences, knowledge and skills that enhance creativity; 19) creating mechanisms to filter ideas and terminate unviable projects; and 20) maximizing learning from past failures (Amabile & Khair, 2008; Rothwell, 1992).

Management and leadership are at the center of this research study for it is considered one of the most significant antecedent factors of innovation. This is because of the belief that leaders play a critical role in encouraging and facilitating

collective learning and creating the climate for innovation through their remarks and behaviors, while organizational leadership (or the management) have the authority to set up systems, structure or relevant programs to indirectly influence innovation (Schein, 2010; Tidd & Bessant, 2009; Yukl, 2009). Apart from that, once contextual factors are installed, skillful leadership is required to maximize the benefits from the new ways of working (Anderson et al., 2014).

Antecedent factor 10: Key individuals energizing or facilitating innovation. The sub-factors are: 1) promoters, champions (i.e. persons who fully support an idea, project, or product, and put efforts to force the idea through any resistance and will evangelize it throughout the organization, also called idea champion change advocate, change agent); 2) gatekeepers (i.e. retriever and disseminator of knowledge and information); and 3) boundary spanning role (i.e. getting in touch and communicating with external players) (Rothwell, 1992; Tidd & Bessant, 2009).

Table 2.1 displays all above-mentioned antecedent factors and all the sub-factors.

Table 2.1 Antecedent Factors of Organizational Innovation

Antecedent Factors of Innovation	Sub-Factors
Individual level factors	
Employee creativity characteristics & skills	<ol style="list-style-type: none"> 1) Domain related expertise and knowledge 2) Creativity skills: <ol style="list-style-type: none"> (1) Divergent thinking (2) Ideational fluency (3) Ability to connect ideas (4) Seeing similarities and differences (5) Being inquisitive (6) Questioning status quo 3) Intrinsic task motivation 4) Openness to experience personality 5) Proactive personality 6) Self-efficacy 7) Self-esteem 8) Tolerance of ambiguity 9) Social network ability

Table 2.1 (Continued)

Antecedent Factors of Innovation	Sub-factors
Work environment factors	
Corporate strategy and shared vision	<ol style="list-style-type: none"> 1) Innovation strategy 2) A clearly articulated shared vision and shared sense of purpose, with an attainable and valued outcome 3) Stretching strategic intent 4) Top management commitment 5) Dissemination of the strategic vision throughout the organization
Organizational design	<ol style="list-style-type: none"> 1) Flat structure 2) Cross-functional teams 3) Decentralization 4) Low formalization 5) High degree of specialization of personnel of each functions 6) Team member diversity

Table 2.1 (Continued)

Antecedent Factors of Innovation	Sub-factors
Work environment factors	
Organizational creativity climate and culture	<ol style="list-style-type: none"> 1) High involvement in innovation organization- wide 2) Idea support 3) Organizational encouragement 4) Supervisory encouragement 5) Workgroup support 6) Open communication across an organization: top-down, bottom-up and horizontal 7) Intra-organizational collaboration 8) Participative safety 9) Trust and openness 10) Debate 11) Autonomy, freedom, empowerment 12) Orientation toward risk 13) Challenging work 14) Absence of workload pressure 15) Absence of organizational impediments (i.e. internal politics, harsh criticism of new ideas, destructive internal competition, risk avoiding, clinging to status quo) 16) Recognition, and rewards (financial and non-financial as appropriate) for innovation performance, performance feedback 17) Idea time 18) Playfulness, humor

Table 2.1 (Continued)

Antecedent Factors of Innovation	Sub-factors
Work environment factors	
Knowledge	<ol style="list-style-type: none"> 1) Knowledge management 2) Learning organization 3) Utilization of both internal and external knowledge for innovation management 4) Information and knowledge sharing 5) Long term commitment to training and development, and education 6) Networking with external sources of know-how 7) Customer and market insights
Resources	<ol style="list-style-type: none"> 1) Sufficient and slack resources 2) Planning and management of knowledge resources, technology resources, financial resources
Technology	<ol style="list-style-type: none"> 1) Utilizing technology for knowledge management 2) Utilization of technology to facilitate innovation and innovative behavior within and among organizations 3) Technological skills and education
Innovation process	Idea generation, selection and evaluation techniques, implementation mechanism
Workgroup process	<ol style="list-style-type: none"> 1) Task orientation toward excellence 2) Clear project vision, powerful product concept 3) Group norms 4) Group cohesiveness 5) Intra-team advice, feedback and collaboration 6) Constructive conflict management

Table 2.1 (Continued)

Antecedent Factors of Innovation	Sub-factors
Work environment factors	
Management and leadership	<ol style="list-style-type: none"> 1) Participative and empowering management style 2) Clear project vision, powerful product concept 3) Orientation toward task excellence and quality 4) Transformational leadership 5) Motivating employees to innovate 6) Risk taking 7) Visioning 8) Leveraging opportunity 9) Adaptation 10) Coordination of information flow 11) Facilitation 12) Open-mindedness 13) Being an appreciative listener 14) Enabling collaboration and combatting the lone inventor misbelief 15) Managing diversity in team to benefit innovation 16) Tapping ideas from all ranks 17) Using metaphors, analogies, and stories to help teams conceptualize together 18) Willingness to take on external ideas 19) Encouraging individuals to gain diverse experiences, knowledge and skills that enhance creativity 20) Creating mechanisms to filter ideas and terminate unviable projects 21) Maximizing learning from past failures
Key individuals facilitating innovation	Promoters, champions, gatekeepers, boundary spanning role and other roles which energize or facilitate innovation

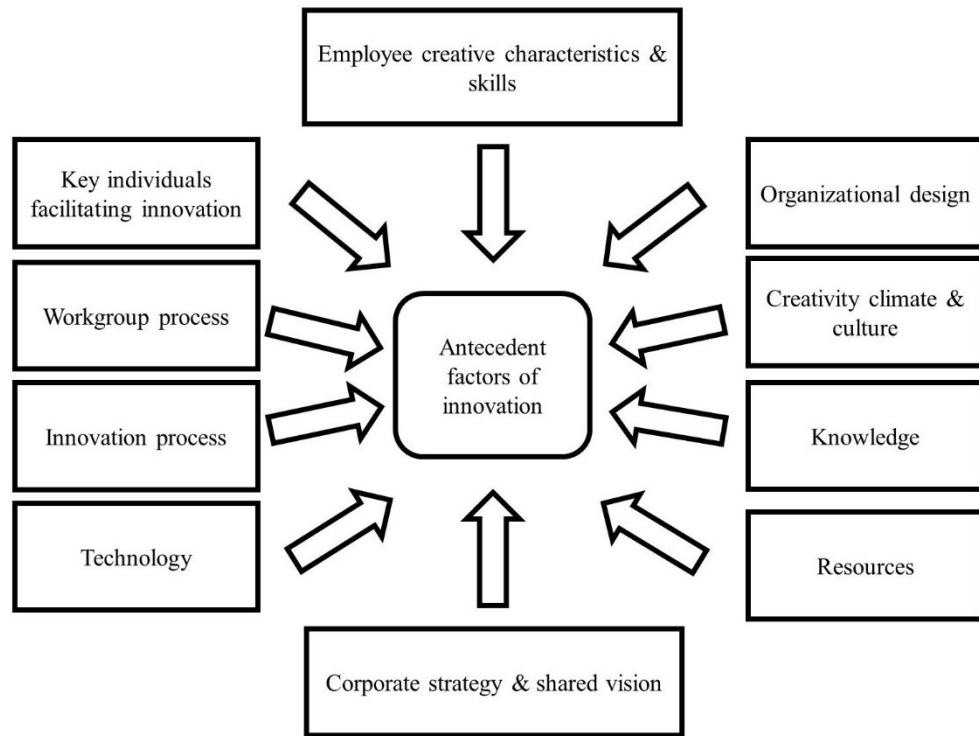


Figure 2.1 Antecedent Factors of Innovation

Figure 2.1 visually displays the antecedent factors of innovation listed in Table 2.1 for easy viewing.

2.2 Overview of Innovation Paradoxes

Traditionally organizations have been vying for competitiveness in the area of quality, cost and performance which are embedded in their management practice up till even now (Sarri, Bakouros, & Petridou, 2010). However, business landscape has been changing fast, the modern days' competitive advantages have evolved to include innovation on top of efficiency, cost, quality and customer responsiveness (Daft, 2015). (See Figure 2.2)

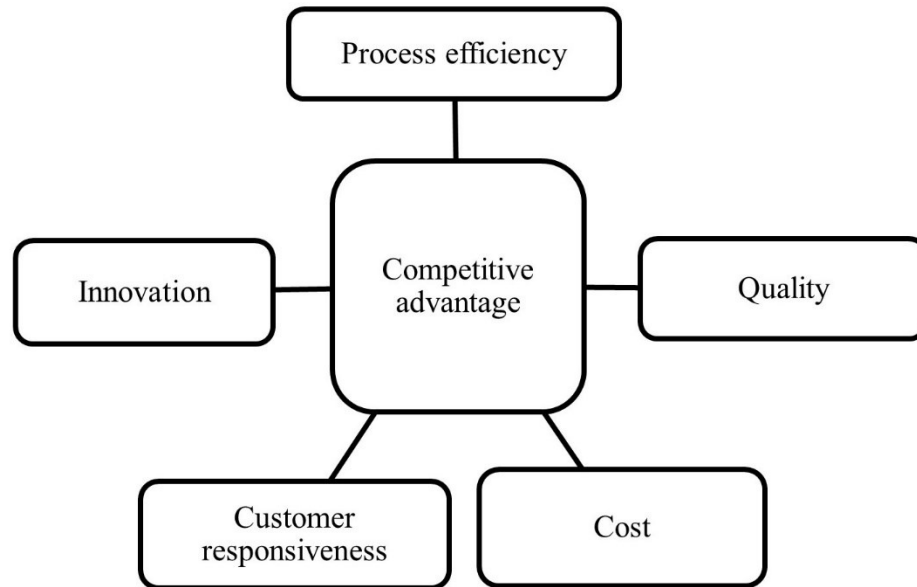


Figure 2.2 Components of Competitive Advantage

To build an innovative organization, a different mindset, skillset and organizational antecedent factors are needed than those for efficiency-driven organizations (March, 1991; Raisch & Birkinshaw, 2008; Tushman & O’Reilly III 1996). These two sets of competencies at times contradict each other and create paradoxes (Daft, 2015; Hurst, 1995). To cope with this contradiction, organizations have to strike a balance between “exploration of new possibilities and the exploration of old certainties” (March, 1991, p. 71). In the recent decades, scholars have proposed integrated frameworks for organizations to manage the paradoxes of innovation and efficiency, through exploratory activities and exploitative activities, in order to maximize organizational performance from both dimensions concurrently (Adler, Goldoftas, & Levine, 1999; March, 1991). They called these organizations “ambidextrous organizations” (Tushman & O’Reilly III, 1996, p. 24), and the quality of being ambidextrous, “organizational ambidexterity” (Raisch & Birkinshaw, 2008, p. 375).

2.3 Ambidexterity

The first usage of the term ambidexterity can be traced back to R. B. Duncan (1976) who coined the term ambidextrous organization. Duncan suggests organizations solve the paradox of competing demands by being ambidextrous, that is setting up dual structures as the means to handle each element of the conflicting demands separately, i.e. one business unit to focus on internal alignment and another on adaptation to organizational environments. McDonough and Leifer's (1986) idea coincide with Duncan's, they suggest that work units apply several structures to deal with the various contingencies they encounter. The researchers discover a number of combinations of structural dimensions, suggesting that the idea of a single fixed structure is inaccurate. Decades after Duncan's proposition, the concept of ambidexterity was made prominent in March's (1991) seminal work in which he suggested simultaneous pursuance of exploration and exploitation activities for organizational survival in the short term and prosperity in the long term respectively. But since both types of activities compete for the same organizational resource and attention, optimizing a mix of both is difficult and unavoidably involves tradeoffs (Duncan, 1976). It is believed that these trade-offs can never be entirely eliminated, organizations must try to reconcile them to a large degree, and in so doing enhance their long-term competitiveness (Gibson & Birkinshaw, 2004). Subsequent research concurs with Duncan's and March's idea but argues that exploitation and exploration are orthogonal to each other rather than positioned on the opposite ends of a continuum that involve tradeoffs (i.e. gaining more on one end by sacrificing on the other) (Auh & Menguc, 2005; Baum, Li, & Usher, 2000; Katila & Ahuja, 2002; Uotila, Maula, Keil, & Zahra, 2009); they positively interact, and both must be maximized in order to attain competitive advantage and long-term success. In other words, organizational scholars have recognized the importance of striking a balance between seemingly contradictory tensions and begun to shift from trade-off (either/or) to paradoxical (both/and) thinking (Gibson & Birkinshaw, 2004; Lavie et al., 2010; Raisch & Birkinshaw, 2008, Simsek, Heavey, Veiga, & Souder, 2009).

2.3.1 Definition of Ambidexterity

Traditionally, ambidexterity refers broadly to an organization's ability to pursue two disparate things simultaneously—such as differentiation and low-cost strategic positioning (Porter, 1980), manufacturing efficiency and flexibility (Adler et al., 1999; Carlsson, 1989), or global integration and local responsiveness (Bartlett & Ghoshal, 1989). However, scholars have put forth several more specific definitions relevant to the context of innovation and efficiency as in the following.

Tushman and O'Reilly III (1996) define organizational ambidexterity as the ability to implement both evolutionary and revolutionary changes by simultaneously pursuing incremental and discontinuous innovation that result from hosting multiple contradictory structures, processes, and cultures, within the same firm.

Adler, Goldoftas, and Levine (1999) define organizational ambidexterity as the ability of organizations to balance the competing demands between efficiency and flexibility.

Helfat and Raubitschek (2000), Winter and Szulanski (2001), Rothaermel and Deeds, (2004) and Gupta et al. (2006) define organizational ambidexterity as sequential pursuit of exploitation and exploration i.e. cycling between long periods of exploitation and short bursts of exploration within a business unit. This is theoretically known as punctuated ambidexterity (Simsek et al., 2009).

Gibson and Birkinshaw (2004), and Raisch and Birkinshaw (2008) define organizational ambidexterity as an organization's ability to achieve alignment in its current operations while also adapting effectively to changing environmental demands. They posited the concept of contextual ambidexterity (in contrast to Duncan's idea of structural ambidexterity) as individuals' behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit.

He and Wong (2004) define organizational ambidexterity as the ability to pursue exploration and exploitation strategies concurrently, so as to carry out technological innovation activities that produce new products for new markets, and technological innovation that bring forth improved product features for existing markets.

Smith and Tushman (2005) define organizational ambidexterity as the ability to build internally inconsistent architectures and cultures into different, separate business

units so that the firm can both explore new knowledge and exploit existing one.

Van Looy, Martens, and Debackere (2005) define organizational ambidexterity as simultaneous presence of activities for both incremental and radical innovation.

Lubatkin, Simsek, Ling, and Veiga (2006) define organizational ambidexterity as the ability to jointly exploit existing competencies as well as explore new ones. They suggested these two facets of organizational learning are inseparable.

Mom, Van Den Bosch, and Volberda (2007) define organizational ambidexterity as the ability to both explore new possibilities in order to cope with future changes in the business environment and to exploit old certainties to meet today's business demands by utilizing both top-down and bottom-up knowledge inflows to enhance exploitation activities, and exploration activities respectively.

Nemanich, Keller, and Vera (2007) define ambidexterity as the simultaneous pursuit of both radical and incremental learning that enhance the ability to explore new capabilities while exploiting existing ones.

Judge and Blocker (2008), and Cao, Gedajlovic and Zhang (2009) define organizational ambidexterity as the organizational ability to explore new market opportunities and efficiently exploiting existing markets at the same time.

Raisch and Birkinshaw (2008) define organizational ambidexterity as firms' ability to simultaneously pursue double-loop and single-loop learning, incremental and radical innovation, stability and transformation in organizational adaptation, induced and autonomous strategic processes, and efficiency and flexibility in organizational design.

Bledow, Frese, Anderson, Erez and Farr (2009) define ambidexterity as the ability of a complex and adaptive system to manage and meet conflicting demands by successfully managing the contradictory tensions of explorative and exploitative activities.

Carmeli and Halevi (2009) define organizational ambidexterity as the capability to concurrently exploit existing competencies as well as to explore new opportunities, both with equal adroitness.

Jansen, Tempelaar, van den Bosch, and Volberda (2009) define organizational ambidexterity as an ability to mobilize, coordinate and integrate scattered contradictory efforts through organizational routines and processes, and to configure and reconfigure

assets and resources across differentiated exploratory and exploitative work units.

Mom, Van Den Bosch, and Volberda (2009) define organizational ambidexterity as a behavioral orientation enabling organizations to combine explorative and exploitative acts concurrently.

Andriopoulos and Lewis (2009) define ambidextrous organizations as capable of handling contradictory knowledge management processes associated with incremental and radical innovation simultaneously.

Markides and Oyon (2010) define organizational ambidexterity as a capability to compete in the same industry strategized with dual business models of exploration and exploitation.

O'Reilly III and Tushman (2013) define organizational ambidexterity as a dynamic capability embedded in leaders to reconfigure existing organizational assets and competencies to explore and exploit, so as to adapt to changing environments. They cautioned that ambidexterity is about developing the necessary capabilities to compete in new markets; and the technologies that enable a firm to survive market turbulence; not just simply about a firm's ability to pursue efficiency and innovation or to compete in multiple markets.

Turner, Swart, and Maylor (2013) define ambidextrous organizations as being able to pursue both exploitation and exploration, by which they utilize and refine existing knowledge while also creating new knowledge to overcome knowledge deficiencies.

Hill and Birkinshaw (2014) define ambidexterity as the capacity to capitalize on existing organizational capabilities and resources and develop new ones to meet future market needs.

Swart, Turner, Rossenberg, and Kinnie (2016) define ambidexterity as the simultaneous pursuit of exploration and exploitation.

Asif (2017) defines ambidexterity as the ability of an organization to balance exploitation and exploration.

Smith et al. (2017) define ambidexterity as an organization's ability to perform explorative and exploitative tasks at the same time.

Based on the analysis and synthesis of the above-mentioned definitions, this study will define organizational ambidexterity as the ability to reconcile internal

tensions and conflicting demands in their tasks by pursuing exploitation activities that utilize existing knowledge in order to be aligned and efficient in their management of today's business demands, while simultaneously pursue exploration activities to create new knowledge for innovation and to be adaptive to changes in the environment. These activities are related to the pursuit of double-loop and single-loop learning, incremental and radical innovation, stability and transformation in organizational adaptation, induced and autonomous strategic processes, and efficiency and flexibility in organizational design.

2.3.2 Literature Streams on Organizational Ambidexterity

Literatures have indicated the significance of organizational learning and knowledge in creating a competitive advantage. Successful organizations learn through experience and refine their existing capabilities, at the same time they also need to create variety in experience through experimenting, innovating, and risk taking. This reflects the importance of ambidexterity in organizations (Levinthal & March, 1993; Lewin & Volberda, 1999; March, 1991).

After Duncan (1976), various scholars took on the concept of ambidexterity through organizational structure and proposed different structural mechanisms as solutions for the competing demands facing organizations (Adler et al., 1999; McDonough & Leifer, 1986; Tushman & O'Reilly III, 1996). Alternately, Gibson and Birkinshaw (2004) put forth an idea of organization contextual ambidexterity suggesting that ambidexterity arises from a business unit's organizational context, specifically systems and processes; the management have to get these contextual elements in place to facilitate ambidexterity across organizations. Apart from the structural and contextual elements, more research studies have started to explore leadership characteristics that enable organizations to manage the contradictions they encounter (Beckman, 2006; Lubatkin, Simsek, Ling, & Veiga, 2006; Smith & Tushman, 2005). This clearly classifies ambidexterity into 3 categories (Raisch & Birkinshaw, 2008): 1) structural ambidexterity; 2) contextual ambidexterity; and 3) leadership-based ambidexterity. (See Figure 2.3)

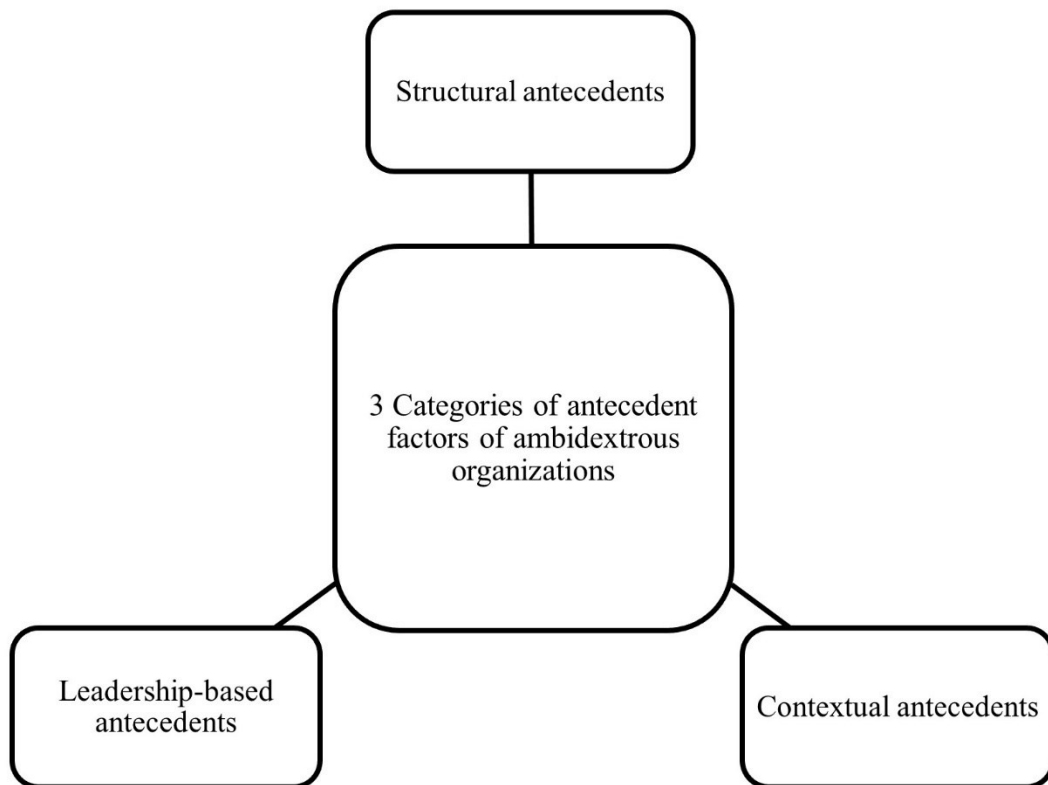


Figure 2.2 Three Categories of the Antecedent Factors of Ambidextrous Organizations

Other studies identify several elements of contradictory demands relevant to organizational ambidexterity, such as flexibility and efficiency (Adler et al., 1999), alignment and adaptability (Gibson & Birkinshaw, 2004), search and stability (Rivkin & Siggelkow, 2003), search scope and depth (Katila & Ahuja, 2002), exploitative and explorative learning (Kang & Snell, 2009), exploratory knowledge sharing and exploitative knowledge sharing (Im & Rai, 2008) incremental and discontinuous innovations (Benner & Tushman, 2003; Smith & Tushman, 2005), and profit-oriented and growth-oriented strategies (Han, 2005). These ambidextrous elements in these studies were identified through the lens of different disciplines and have been categorized into various streams. Specifically, Raisch and Birkinshaw (2008), Papachroni, Heracleous, and Paroutis (2015), and Lavie et al. (2010) categorize these studies into 5 streams: 1) organizational learning; 2) technological innovation; 3)

organizational adaptation; 4) strategic management; and 5) organizational design (organizational theory).

The following presents the discussion of these literature streams in fuller details.

2.3.2.1 Organizational Learning

March's (1991) article first introduces the concept of exploitation and exploration, and the differentiation between the two. He focuses on the type or degree of learning in each orientation and suggested the need to pursue both activities in organizations.

Research defines exploitation as reuse of existing organizational knowledge and thus associated all learning to exploration (Rosenkopf & Nerkar, 2001; Vassolo, Anand, & Folta, 2004; Vermeulen & Barkema, 2001). Others concur with March and focused on the type and degree of learning rather than the existence or non-existence of learning in the two orientations (Benner & Tushman, 2003; Gupta et al., 2006; He & Wong, 2004). For example, Baum, Li, and Usher (2000) indicate the difference of exploitation and exploration. They identify exploitation with learning gained from local search, experiential refinement, and selection and reuse of existing routines while they relate exploration to learning attained through processes of concerted variation, planned experimentation and play. And if one refers to extant organizational learning theories, exploitation and exploration can be identified with Argyris & Schon's (1978) single-loop and double-loop learning, adaptive and generative learning (Senge, 1991), local search and long jump (Levinthal, 1997), and product innovation and production-oriented learning (McKee, 1992). Whereas March considers the two types of learning as fundamentally incompatible, subsequent studies often conceptualize exploitation and exploration as orthogonal variables that can be achieved simultaneously (Auh & Menguc, 2005; Baum, Li, & Usher, 2000; Katila & Ahuja, 2002). For example, Mom, van den Bosch, and Volberda (2007) illustrate that managers may pursue high levels of exploitation as well as exploration activities by acquiring top-down knowledge inflows from people higher-up in the hierarchy, which are related to exploitation, while simultaneously pursue explorative learning through bottom-up knowledge inflows from people lower-down in the hierarchy, or from horizontal inflows from peers. The more a manager acquires top-down and bottom-up or horizontal knowledge flows, the higher the levels of exploitation and exploration in

which the manager engages.

2.3.2.2 Technological Innovation

Literature on technological innovation distinguishes between incremental and radical or discontinuous innovation (Abernathy & Clark, 1985; Dewar & Dutton, 1986; Tushman & Anderson, 1986; Tushman & O'Reilly III, 1996). Incremental innovation is the innovation that offers relatively minor adaptations of existing products and business concepts, whereas radical or discontinuous innovation refers to fundamental changes that lead to replacing existing products or concepts with entirely new ones (Raisch & Birkinshaw, 2008). Tushman and O'Reilly III (1996), Benner and Tushman (2003), and Tushman and Smith (2002) associate exploration and exploitation with these technological innovation types. They identify incremental innovations as exploitative innovations; and explorative innovations as radical or discontinuous innovations. Explorative innovations require new knowledge or departure from existing knowledge and technology; and involve searching for new organizational routines, experimentation, risk-taking and discovery of new approaches to technologies, products, businesses, and processes (Abernathy & Clark, 1985; Levithal & March, 1993). Exploratory innovations result in new designs, create new markets, and develop new channels of distribution (Abernathy & Clark, 1985; Benner & Tushman, 2003; Danneels, 2002; McGrath, 2001). In contrast, organizations that pursue exploitative innovations utilize and refine their existing capabilities, knowledge, processes and operate in their current structures and focus on existing activities in their current domains (Benner & Tushman, 2003; Danneels, 2002; Holmqvist, 2003). Outputs from exploitative innovations include better product features, production, efficiency and improvement in current distribution channels to meet the needs of existing customers (Abernathy & Clark, 1985; March, 1991).

Despite theories on ambidextrous organizations underlining the importance of balancing and synchronizing exploratory and exploitative innovations, several scholars specify the tensions and difficulty of executing both types of innovations in one same organization (Abernathy & Utterback, 1978; Dougherty, 1992; Nadler, Tushman, & Nadler, 1997; Tushman & O'Reilly III, 1996; Volberda, 1996). For example, Leonard-Barton (1992) identify a paradox of capability-rigidity in product innovation claiming exploitation of existing product innovation capabilities

refine and strengthen the capability and knowledge in use, which causes rigidity that hinders exploration of new competencies. This is further illustrated by Sorensen and Stuart (2000) who show that older firms generate less relevant innovations because they rely on improved but older routines. Thus, firms that are able to gradually improve existing dominant design as well as to initiate major technological breakthroughs gain major advantages over rivals. Burns and Stalker (1961) argue that two different organizational designs, a mechanistic and organic structure, are appropriate for exploitative innovations and exploratory innovations respectively. However, there is little empirical evidence showing how organizations can be organic as well as mechanistic and pursue both types of innovations simultaneously (Bradarch, 1997; Brown & Eisenhardt, 1997; Nord & Tucker, 1987).

While some scholars are concerned about the challenges of simultaneous pursuit of exploitative and explorative innovations, on the contrary, other scholars stress the importance of pursuing both innovation processes. This is illustrated by Tushman and O'Reilly III's (1996) definition of organizational ambidexterity as the ability to pursue both incremental and discontinuous innovation concurrently. Likewise, Ancona, Goodman, Lawrence, and Tushman (2001) suggest that dynamic capabilities are rooted in exploitative and explorative innovations. Colbert (2004) suggests that the interaction between exploration and exploitation reflects a complex capability that provides an additional source of corporate advantage beyond those provided by each innovation activity individually. In the same vein, several authors second the idea of ambidexterity in this context and propose various dimensions to balance the two innovation types (Atuahene-Gima, 2005; Brown & Eisenhardt, 1997; O'Reilly III & Tushman, 2004; Sheremata, 2000).

2.3.2.3 Organizational Adaptation

A number of scholars have suggested that long-term success stems from balancing continuity and change (Brown & Eisenhardt, 1997; Leana & Barry, 2000; Miller & Friesen, 1984; Probst & Raisch, 2005; Tushman & Romanelli, 1985; Volberda, 1996). For example, Miller and Friesen (1983, 1984) posit that organizational and environmental variables are interdependent and manifest synergistic configurations of elements of strategy, structure, and environment, that mutually reinforce each other; and that successful organizations exhibited a pattern of

organizational change that is both dramatic and quick. Tushman and Romanelli (1985) develop a model of organizational evolution explaining that organizations experience long periods of convergence punctuated by short periods of major discontinuous changes. These organizations reorient their structure or strategy according to environmental conditions. To achieve long-term success, organizations need the ability to emphasize efficiency when going through periods of evolutionary change and to emphasize quick discontinuous transformations in strategic orientation during the periods of revolutionary change (Tushman & O'Reilly III, 1996). In other words, during evolution periods, organizations aim at enforcing consistency or alignment between internal activities and the external environment so as to achieve high performance, and to pursue radical transformation and exploration in periods of revolutionary change. Meyer and Stensaker (2006) suggest organization's capacity for change is derived through its ability to balance changes and daily operations. The need for balance between continuity and change is also reflected by related constructs, such as: absorptive capacity (Jansen, van den Bosch, & Volberda, 2005; Zahra & George, 2002), organizational identity (Dutton & Dukerich, 1991; Gagliardi, 1986; Gioia, Schultz, & Corley, 2000), and in recent redefinitions of organizational routines (Feldman & Pentland, 2003). Brown and Eisenhardt (1997) argue that there is a need to change proactively, through regular deadlines or as known as 'time pacing'. Others suggest that managers must take initiatives to mediate between forces for convergence and those for change (Tushman & Romanelli, 1985). It is believed that top management facilitate discontinuous change, whereas middle management facilitate incremental change (Floyd & Woolridge, 1996; Shrivastava, 1986). Conversely, Huy (2002) propose a theory stating that middle managers are the driving force of organizational adaptation through emotional balancing of continuity and change.

2.3.2.4 Strategic Management

Burgelman's (1991, 2002) internal ecology model of strategy distinguishes between variation-reducing, induced strategic processes and variation increasing, autonomous strategic processes. The induced processes are based on the retrospective sense making, the attempt to capture organizational learning based on past success, and the initiatives that are within the scope of current strategies. The processes tend to maintain the organization context, and lead to incremental and peripheral

adaptation. On the contrary, autonomous strategic processes aim to expand a firm's domain; they concern initiatives that emerge outside the scope of current strategies and involve the creation of new competencies. In this sense, induced strategic processes serve as a variation-reduction mechanism relating to exploitation, while autonomous strategic processes allow firms to move to a new curve of adaptation and renewal, which is related to exploration. Both types of strategy processes compete for scarce resources: Company leaders therefore make trade-offs between them.

Burgelman (1991, p. 256) suggests that combining the two strategic processes may be the most beneficial: "organizations may have to keep both processes in play at all times, even though this means that the organization never completely maximizes its efforts in the current domain". A number of subsequent studies provide arguments similar to those of Burgelman, despite using different terms and mostly without referring to one another. For example, Ghemawat and Ricart Costa (1993) distinguish between static efficiency and dynamic efficiency. They describe the organizational trade-off between these two strategic processes and demonstrate that organizations have a tendency to focus on either one of the two efficiency orientations. The reason why organizations have difficulty switching between the two efficiency orientations is that doing so involves sunk costs, opportunity costs (of the path not taken), different sets of socially complex resources, and inertial tendencies in the organizations. Hamel and Prahalad (1993) introduce the concept of leverage and stretch—leverage, being the need to exploit existing capabilities and stretch, being the search for new ones. The study emphasizes that the tension between leverage and stretch is a key strategic challenge for creating competitive advantage. The researchers clarify that most thinking on the topic of strategic fit is static; that is, focusing on the fit between existing resources and opportunities. A firm's ability to leverage its resources serves as a key in creating a competitive advantage through the use of its capabilities organization-wide, capability improvement through cooperation with others, and employing its capabilities for the highest returns. However, firms also need stretch, a purposely created misfit between the firm and its environment by means of "a chasm between ambition and resources" (Hamel & Prahalad, 1993, p. 84) or extending itself to the limit. Accordingly, Sanchez, Heene, and Thomas (1996) argue that successful firms have the capability of maintaining a mix of competence-

leveraging and competence-building activities. Competence leveraging is the application of existing competences, whereas competence building is the development of new ones. A firm engages in competences leveraging when applying its existing competences to market opportunities without requiring qualitative changes in the firm's assets or capabilities. Conversely, a firm engages in competence leveraging when exercising its existing options for action derived from its prior competence building. Heterogeneity, or differences of competencies among firms in changing industries, arises from its path-dependency in developing competencies (in other words, from its tendency to continue a past or traditional practice or preference), and differences in the capacity to maintain a combination of competence building and competence leveraging activities. These differences are determined by a firm's goals, its strategic logic for achieving goals, and by the firm's coordinating efforts in deploying its resources to pursue its goals (Sanchez & Heene, 1997). Finally, Volberda, Baden-Fuller, and van den Bosch (2001) distinguish between selective and adaptive strategic actions by building on Lewin and Volberda's (1999) theories of selection and adaptation. Selection perspectives view renewal as highly restricted by resource scarcity, convergence to industry norms, and structural inertia, with the aim for profit for today. The strategic activities are limited to strengthening and exploiting their existing core competencies. By contrast, adaptation perspectives suggest that firms can and do change, overcoming their rigidities. Successful firms learn to behave differently and explore new competencies and aim for adaptation for the future. The scholars suggest reconciliation of the conflicting forces of profits for today and flexibility to adapt for tomorrow. Profits for today requires order, control, and stability which is exploitation in nature, while adaptation for tomorrow needs flexibility and creativity which is exploration in nature. These contradictory demands are the challenge from exploration and exploitation that firms face (Volberda, Baden-Fuller & van den Bosch, 2001). The researchers classify the strategic renewal actions that firms can take into categories of 1) exploitative actions that strengthen a firm's current product-market combination; and 2) explorative actions that involve new modes of value creation. The exploitative actions are path-dependent and associated with incremental change. Whereas the exploratory actions create a new path or alter existing paths and are considered to be relatively radical (Volberda, 2017).

2.3.2.5 Organization Design

Organization theory scholars have long discussed the challenge of utilizing organizational features that facilitate both innovation/flexibility and efficiency simultaneously (Raisch & Birkinshaw, 2008). Galbraith (1982), for example, indicate that business operations and innovations require fundamentally different organizational structures. Thompson (1967, p. 15) describes the “paradox of administration” which refers to the dual search for certainty and flexibility and involves short and long-term perspective of administration. Burns and Stalker (1961) distinguish between mechanistic and organic structures. They posit that mechanistic structures facilitate efficiency and stable conditions by means of standardization, centralization, and hierarchy; whereas organic structures suit changing conditions, thus support flexibility by means of decentralization and autonomy. Duncan (1976) suggests that organizations require dual structures, namely, organic and mechanistic structures. Organic structures support initiation of innovations and mechanistic structures facilitate the implementation and commercialization of the innovations. Some researchers believe that both organic and mechanistic structures are difficult to implement simultaneously within the same firm (Ford & Ford, 1994; Lawrence & Lorsch, 1967; Lewis, 2000). Conversely, recent studies claim that an optimal combination of mechanistic and organic features (Adler et al., 1999; Jansen et al., 2005; Sheremata, 2000) or a contextual ambidexterity (Gibson & Birkinshaw, 2004) could be the solutions for the paradox. This perspective aptly illuminates Tushman and O’Reilly III’s (1996) definition of ambidexterity describing ambidexterity as a firm’s ability to operate complex organizational designs that provide for short-term efficiency and long-term innovation.

Figure 2.4 displays visually all the above-mentioned literature streams.

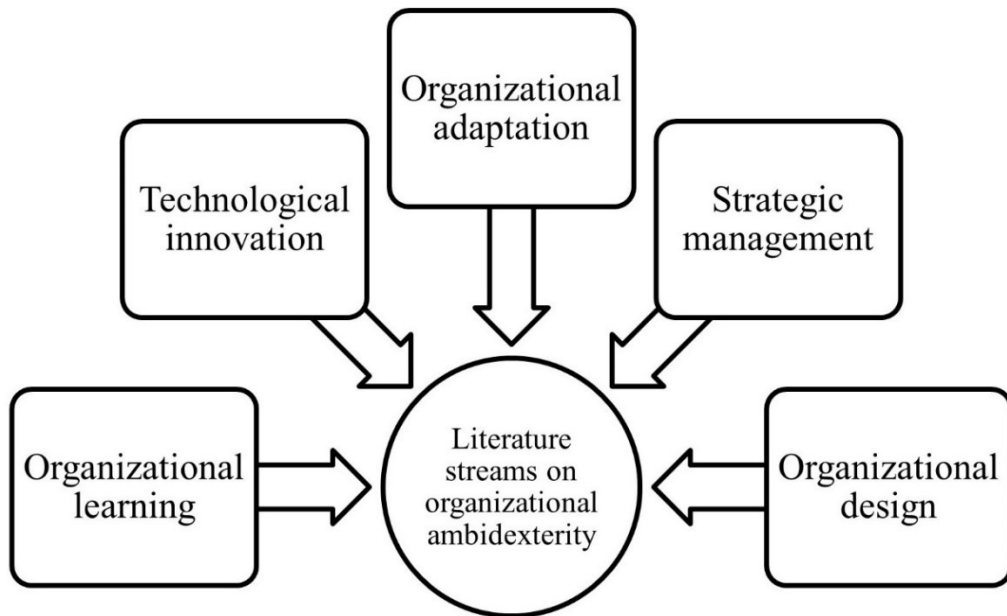


Figure 2.4 Literature Streams on Organizational Ambidexterity

Among these literature streams on ambidexterity, a majority of the studies concur with March's (1991) proposition of exploitation and exploration, and the reconciliation of the two orientations. They prominently built on his notions and posit exploitation and exploration as two representative elements of organizational ambidexterity (Lavie et al., 2010; Raisch & Birkinshaw, 2008, Simsek et al., 2009).

Apart from the research studies cited in Raisch and Birkinshaw (2008), and Papachroni, Heracleous and Paroutis (2015), a number of other research studies cited in Simsek et al. (2009) also inform this proposition and treat exploration and exploitation as the constitutional elements of ambidexterity, as listed in the following.

Kyriakopoulos and Moorman (2004) studied 96 Dutch business units to examine the complementarities between exploitation and exploration in their marketing strategy.

Rothaermel and Deeds (2004) studied 325 biotechnology companies on exploratory alliances vs. exploitative alliances.

He and Wong (2004) made an empirical study by a large-scale survey of 206 manufacturing firms in Singapore and Penang to investigate exploratory

innovation vs. exploitative innovation.

Jansen et al. (2005) made an empirical study by a large-scale survey of multi-unit firm on exploitation vs. exploration.

Atuahene-Gima (2005) did an empirical study of 227 electronics firms in China to study competence exploitation vs. competence exploration.

Bierly and Daly (2007) examined exploitation vs. exploration activities in 98 SME manufacturing firms.

Andersen and Nielsen (2007) studied centralized exploitative strategy processes vs. decentralized exploratory strategy processes by a survey of 185 manufacturing firms.

Swart and Kinnie (2007) did a case study of a marketing agency on their exploitative learning vs. exploratory learning.

Im and Rai (2008) studied exploitative knowledge sharing vs. exploratory knowledge sharing through a survey of logistics industry.

Incidentally, it is clearly demonstrated in these research streams, as well as in Simsek et al. (2009) that exploration and exploitation play an extremely significant role in the study of organizational ambidexterity and they readily represent the constitutional elements of organizational ambidexterity.

2.3.3 Exploration and Exploitation

The concept of exploration–exploitation has been studied in a wide variety of literature such as organizational learning (e.g., Levinthal & March, 1993; March, 1991), organizational design (e.g., Tushman & O’Reilly III, 1996), knowledge management (e.g., Brown & Duguid, 2001), and adaptation (e.g., Eisenhardt & Brown, 1998). These concepts have been employed in various contexts such as technology development and product innovation (e.g., Danneels, 2002; Greve, 2007; He & Wong, 2004; Tushman, Smith, Wood, Westerman, & O’Reilly III, 2007), strategic alliances (e.g., Beckman, Haunschild, & Phillips, 2004; Koza & Lewin, 1998; Lavie & Rosenkopf, 2006; Rothaermel & Nerka, 2001; Rothaermel & Deeds, 2004), and senior-management teams (e.g., Beckman, 2006; McGrath, 2001). Furthermore, the concept of exploration and exploitation has been investigated at various levels of analysis, generating research at the individual (e.g., Mom, Van den Bosch, & Volberda, 2007), group (e.g., Beckman,

2006; McGrath, 2001), organizational (e.g., Benner & Tushman, 2003; Greve, 2007; Harreld, O'Reilly III, & Tushman, 2007; Jansen, Van Den Bosch, & Volberda, 2006), inter-organizational (e.g., Lavie & Rosenkopf, 2006; Lin, Yang, & Demirkan, 2007; Vassolo, Anand, & Folta, 2004), and industry levels (e.g., Gilsing & Nooteboom, 2006).

Concurrences in explaining organizational ambidexterity through the lens of exploration and exploitation among these researchers over a long period of time establishes exploration and exploitation as the comprehensive main approach in the study of organizational ambidexterity (Hill & Birkinshaw, 2014).

2.3.3.1 Definition of Exploration and Exploitation

March (1991) is the first to propose the concept of exploration and exploitation in organizational learning. He acknowledges the fundamental distinction between two gestalts of organizational behavior. “Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution” (March, 1991, p. 71). Both types of activity enhance organizational learning and prosperity. However, both activities include inherent contradicting demands that must be balanced (Tushman & O'Reilly III, 1996). Earlier on, scholars focused on the narrow sense of March's concept to emphasize creation of new knowledge versus refinement of existing knowledge (Levinthal & March, 1993). Subsequent studies have shifted to apply the concept to a wider scope that includes various manifestations of diversity, diversification, search, variation, risk taking, experimentation, strategic competency building and innovation on the one hand, organizational focus, experience, selection, refinement and competency leveraging, variance reduction, on the other (Lavie et al., 2010; Raisch & Birkinshaw, 2008).

2.3.3.2 Exploration and Exploitation and Its Association with Various Fields of Study

Apart from organizational learning which is seemingly the original domain of the concept of exploitation and exploration, subsequent studies have seamlessly been applied to explain phenomena on organizational ambidexterity in various fields of study, as shown in the following:

1) Exploration-Exploitation in Organizational Learning

Baum, Li, and Usher (2000) describe exploration as learning attained through processes of concerted variation, planned experimentation and play, while they related exploitation to learning gained from local search, experiential refinement, and selection and reuse of existing routines.

2) Exploration-Exploitation in Technological Innovation

Tushman and O'Reilly III (1996), Benner and Tushman (2003), and Tushman and Smith (2002) identify explorative innovations as radical or discontinuous innovations; and exploitative innovations as incremental innovations. Explorative innovations require new knowledge or departure from existing knowledge and technology (Abernathy & Clark, 1985; Levithal & March, 1993). In contrast, exploitative innovations utilize and refine existing capabilities, knowledge, processes and structures and focus on existing activities in current domains (Benner & Tushman, 2003; Danneels, 2002; Holmqvist, 2003).

3) Exploration-Exploitation in Organizational Adaptation

Tushman and O'Reilly III (1996) associate exploitation to periods of evolutionary change and exploration to periods of revolutionary change. To achieve long-term success, organizations need the ability to emphasize efficiency when going through periods of evolutionary change and to emphasize quick discontinuous transformations in strategic orientation during the periods of revolutionary change (Tushman & O'Reilly III, 1996).

4) Exploration-Exploitation in Strategic Management

Exploration vs. exploitation is associated with competency building vs. competency leveraging (Sanchez, Heene, and Thomas (1996); adaptive strategic actions vs. selective strategic actions (Volberda et al., 2001); stretch strategies vs leverage strategies (Hamel & Prahalad, 1993); dynamic efficiency vs. static efficiency (Ghemawat & Ricart i Costa, 1993).

5) Exploration-Exploitation in Organization Design

Exploration is associated with organic structures, and exploitation with mechanistic structures. Organic structures facilitate initiating innovations and mechanistic structures, the implementation of innovations (Burns & Stalker, 1961; Duncan, 1976); flexibility and efficiency (Adler et al., 1999).

2.4 Paradoxes in Ambidextrous Organizations and Antecedent Factors of Organizational Ambidexterity

A paradox is “an idea involving two opposing thoughts or propositions which, however, contradictory, are equally necessary to convey a more imposing, illuminating, life-related or provocative insights into truth than either factor can muster in its own right” (Slaatte, 1968, p. 4). Lewis (2000, p. 760) illustrates that paradoxes are “contradictory yet interrelated elements that seem logical in isolation but absurd and irrational when appearing simultaneously”. Overall, scholars often use the term paradox to refer to seemingly contradictory elements, conflicting demands, or illogical findings. The key characteristic of a paradox is “the simultaneous presence of contradictory even mutually exclusive elements” (Quinn & Cameron, 1988, p. 2).

The concept of paradox was introduced as a framework to deal with the inherent complexity of organizational life by Cameron and Quinn (1988) and has received increased attention in the organizational theory literature as organizations become more complex, dynamic, and pluralistic (Clegg, Cunha, & Cunha, 2002; Poole & Van De Ven, 1989; Smith & Lewis, 2011). In the domain of innovation studies, research shows that innovation is characterized by paradoxes (Miron, Erez, & Naveh, 2004) which are also referred to as tensions (Lewis, Welsh, Dehler, & Green, 2002), contradictions (King, Anderson, & West, 1991), dilemmas (Benner & Tushman, 2003), and the so-called dark side of innovation processes (Anderson & Gasteiger, 2007). Organizations are deemed to be constituted at the core by paradoxes such as autonomy and control, collective action and individual interests, closed and open systems (Bouchikhi, 1998; Smith & Lewis, 2011), continuity and change in the face of radical change (Huy, 2002), collaboration and control in corporate governance (Sundaramurthy & Lewis, 2003); and paradoxes of committing to multiple strategic goals (Jarzabkowski & Sillince, 2007). In a more encompassing paradox perspective, Smith and Lewis (2011) identify four categories of paradoxes within organizations: paradoxes of learning (based on the tensions created between the old and the new), paradoxes of organizing (based on the diverging forces for control and flexibility), paradoxes of belonging (stemming from the tension between the self and the other within an organizational context), and lastly,

paradoxes of performing (stemming from the plurality of goals from internal and external stakeholders). These paradoxes represent core organizational activities (knowledge, interpersonal relationships, processes, and goals), and occur not only within each category, but also at their intersections and across organizational levels.

2.5 Paradoxes in Ambidextrous Organizations

Research studies in organizational ambidexterity have identified a number of paradoxes arising in the course of managing for both innovativeness and efficiency simultaneously. Both contradictory elements in the paradoxes must be balanced to maximize innovation and efficiency for long-term prosperity and short-term achievement. These paradoxes can be categorized according to the afore-mentioned domains of innovation antecedents, the literature streams on ambidexterity and Smith and Lewis' (2011) four categories of paradox as follows:

2.5.1 Paradoxes in Individual's Characteristics: Openness to Experience vs. Conscientiousness

Openness is about being imaginative, original, flexible, and unconventional. Openness enhances an individual's intrinsic motivation towards novelty and therefore works in a multiplicative way to produce innovation (Feist, 1998; King, McKee, & Broyles, 1996; McCrae, 1987). Whereas conscientiousness is defined by terms such as fastidious, ordered, neat and methodical and dutiful. Individuals high on conscientiousness are more resistant to changes at work and are more likely to comply with current organizational norms. These qualities are closely associated with lack of innovation but positively associated with efficiency and quality (Buttner & Gyskiewicz, 1993; Oldham & Cummings, 1996; Robertson, Baron, Gibbons, MacIver, & Nyfield, 2000).

2.5.2 Paradoxes of Exploration and Exploitation

Exploration is described as the activities such as discovery, innovation, search, experimentation, risk taking, variation, play, flexibility; whereas exploitation includes such things as efficiency, refinement, production, implementation, selection, choice, execution (March, 1991). Exploitation utilizes existing knowledge which leads to incremental improvement of existing products or processes, thus resulting in lower cost, better quality, in turn, organizational efficiency. Whereas exploration is the creation of new knowledge leading to radical innovation and resulting in new products, new process, new business model and strategies. Therefore, pursuing exploitation to the exclusion of exploration may enhance short term performance, but it could result in lack of new innovations and the inability to respond adequately to environmental changes. Vice versa, pursuing exploration without balancing exploitation facilitates renewal of organizational knowledge base but results in organizations getting trapped in endless cycles of search, over-investment in experimentation (Ahuja & Lampert, 2001; Leonard-Barton, 1992; Levithal & March, 1993; Raisch & Birkinshaw, 2008; Tushman & Anderson, 1986). Various scholars have concurred with March (1991) and treated exploration and exploitation as the fundamental components of paradox in ambidexterity (Bierly & Daly, 2007; Gupta et al., 2006; Jansen et al., 2005; Kang & Snell, 2009; Lavie & Rosenkopf, 2006; Winter & Szulanski, 2001).

2.5.3 Paradoxes in Organizational Learning

Basically, the paradoxes in this organizational learning domain are that of explorative learning vs exploitative learning and are expressed in various terms such as exploitative knowledge sharing vs. exploratory knowledge sharing (Im & Rai, 2008), bottom-up knowledge inflows vs. top-down knowledge inflows (top-down is important to maintain focus and commitment, bottom-up is important to extract creativity and create momentum) (Mom et al., 2007; Verloop & Wissema, 2004); incremental learning vs. step function (radical) learning (Helfat & Raubitschek, 2000), search depth vs. search scope (Katila & Ahuja, 2002), cognitive differentiation vs. cognitive integration (Smith & Tushman, 2005).

Organizations need to manage these paradoxes to balance short term efficiency and long-term innovation by supporting the search for new knowledge and prospective

opportunities and simultaneously leverage currently available knowledge to address immediate needs (March, 1991)

2.5.4 Paradox in Innovation Process: Initiation vs. Implementation of Innovation

The innovation process is consisted of two sequential stages: the creation of new and novel ideas and the realization of the ideas into final outputs (Axtell et al., 2000; Tidd & Bessant, 2009). These stages require different antecedent factors, skillsets and mindsets (March, 1991; Raisch & Birkinshaw, 2008; Tushman & O'Reilly III 1996).

Duncan (1976) mentions these contradictory demands in the innovation process as a paradox of initiation vs. implementation of innovation.

2.5.5 Paradoxes in Technological Innovation: Radical vs. Incremental Innovation

Radical innovations require new knowledge or departure from existing knowledge and technology; and involve searching for new organizational routines, experimentation, risk-taking and discovery of new approaches to technologies, products, businesses, and processes (Abernathy & Clark, 1985; Levithal & March, 1993). Radical innovations result in new designs, create new markets, and develop new channels of distribution (Abernathy & Clark, 1985; Benner & Tushman, 2003; Danneels, 2002; McGrath, 2001). In contrast, organizations that pursue incremental innovations utilize and refine their existing capabilities, knowledge, processes and operate in their current structures and focus on existing activities in their current domains (Benner & Tushman, 2003; Danneels, 2002; Holmqvist, 2003).

Apart from the term radical innovation and incremental innovations, there are other similar terms, such as: exploratory innovation vs. exploitative innovation (He & Wong, 2004); discontinuous vs incremental innovation (O'Reilly III & Tushman, 2004; Tushman & O'Reilly III, 1996; Benner & Tushman, 2003; Smith & Tushman, 2005); long term innovation and short-term efficiency (Tushman & O'Reilly III, 1996).

2.5.6 Paradoxes in Organizational Adaptation: Adaptability vs. Alignment

Scholars have posited long-term success stems from balancing the paradox of adaptability and alignment. Adaptability refers to the capacity to reconfigure activities in the business unit quickly to meet changing demands in the task environment; while alignment refers to coherence among all the patterns of activities in the business unit in which they are working together toward the same goals. (Gibson & Birkinshaw, 2004; Tiwana, Bharadwaj, & Sambamurthy, 2007; Tiwana, 2008). Adaptability is associated with exploration, whereas alignment is associated with exploitation (Lewin, Long, & Carroll, 1999; March, 1991). Hence, organizations that focus on alignment trade flexibility for stability because they build organizational inertia, making it difficult to introduce changes in the face of environmental threats (Hannan & Freeman, 1977; Sorensen & Stuart, 2000); whereas organizations that focus on adaptability without taking alignment into account create organizational chaos (Huy, 2002; Levinthal & March, 1993; Sastry, 1997).

The paradoxical elements in this domain come in various other terms, such as; adaptability and stability (adaptability is associated with exploration, whereas stability is associated with exploitation) (Lewin, Long, & Carroll, 1999; March, 1991); change and continuity (Brown & Eisenhardt, 1997; Leana & Barry, 2000; Miller & Friesen, 1984; Probst & Raisch, 2005; Tushman & Romanelli, 1985; Volberda, 1996); implementing changes and maintaining daily operations (Meyer & Stensaker, 2006); search and stability (Riykin & Siggelkow, 2003); flexibility and efficiency (Adler et al., 1999),.

2.5.7 Paradox in Strategic Management: Long Term Innovation vs. Short Term Efficiency

A central premise of March's (1991) framework concerns the inherent tradeoffs between exploration and exploitation. The opposing nature of these activities derives from several stylized facts about resource-allocation constraints, organizational inertia, and desirable organizational outcomes. First, organizations make conscious choices to support exploration or exploitation activities by making resource-allocation decisions, thereby facing trade-offs between the expected consequences of these activities.

Organizations trade off short term efficiency for long-term innovation by supporting the search for new knowledge and prospective opportunities instead of leveraging currently available knowledge to address immediate needs (March, 1991). Similarly, by allocating resources to the refinement of existing technologies and the leveraging of existing competencies rather than to developing new skills and capabilities, organizations achieve immediate reliability at the future risk of becoming obsolete (Holmqvist, 2003; Leonard-Barton, 1992).

This paradox category includes similar paradoxical pairs of element, such as : decentralized exploratory strategy processes vs. centralized exploitative strategy processes (Andersen & Nielsen, 2007); pro-growth vs. pro-profit strategies (Han, 2005); exploration vs. exploitation in marketing strategy (Kyriakopoulos & Moorman, 2004); exploratory alliances vs. exploitative alliances (Rothaermel & Deeds, 2004); strategic vision vs. operational excellence (Tarafdar & Gordon, 2007); adaptability vs .alignment of alliances (Tiwana, 2008); competency building vs. competency leveraging (Sanchez, Heene, and Thomas (1996); adaptive strategic actions vs. selective strategic actions (Volberda et al., 2001); stretch strategies vs leverage strategies (Hamel & Prahalad, 1993);

2.5.8 Paradoxes in Organizational Design

2.5.8.1 Paradox of Autonomy vs. Control (Decentralization vs. Centralization)

Autonomy or freedom is posited as the element that enhances innovation (Amabile et al., 1996); whereas system and control are the elements that facilitate efficiency (Daft, 2015; Hurst, 1995). Examples of paradoxes in organizational design are: paradox of autonomy and flexibility vs. supervision and formal milestones (Lewis, Welsh, Dehler, & Green, 2002); paradox of administration (which refers to the dual search for certainty and flexibility and involves short and long-term perspective of administration) (Thompson, 1967).

2.5.8.2 Paradox of Organic vs. Mechanistic Structures

A mechanistic structure supports changes by means of standardization, centralization, and hierarchy; whereas an organic structure supports flexibility by means of decentralization and autonomy (Burns & Stalker, 1961).

2.5.8.3 Paradox of Diversity and Homogenous Team Members

Miron-Spector, Erez, and Naveh (2006) find that the most innovative teams are composed of a majority of highly creative people, a moderate number of conformists (who know how to fit the product to the context), and a small number of members who are highly attentive to detail; teams with this composition are more innovative than homogenous teams composed of only creative people. Such a mix ensures that different task demands of idea generation and implementation are met.

2.5.9 Paradox of Competencies

2.5.9.1 Paradox of Flexibility vs. Efficiency Competencies

Flexibility competency is the ability to develop new skills and capabilities; it enables organizations to gain competencies for new innovations which result in future competitiveness. While efficiency competency is the refinement of existing technologies and the leveraging of existing competencies and it enables organizations to achieve immediate reliability and results. (Holmqvist, 2003; Leonard-Barton, 1992).

Paradoxes in this dimension have been proposed in various forms. For example, Leonard-Barton (1992) describes a capability–rigidity paradox in product innovation (exploiting existing product innovation capabilities may have dysfunctional rigidity affects that crowd out exploration of new competencies); dynamic efficiency vs. static efficiency (static efficiency being the refinement of existing products, processes, and capabilities within a fixed set of existing conditions; and dynamic efficiency being continuously reconsidering initial conditions and develop new products, processes, and capabilities) (Ghemawat & Ricart Costa, 1993); competence exploration vs. competence exploitation (Atuahene-Gima, 2005); creativity and standardization (creativity, being explorative and standardization, exploitative) (Gilson, Mathieu, Shalley, & Ruddy, 2005).

2.5.9.2 Paradox of Divergent and Convergent Thinking

Divergent thinking increases variability in ideas, which enhance the idea generation, whereas convergent thinking reduces variability of ideas, which supports the implementation of innovation. (Bledow et al., 2009; Verloop & Wissema, 2004).

2.5.10 Paradox of Belonging

Innovation process is a group activity requiring different complimentary abilities, points of view and collaboration from members of the group. But at the same time, creative individuals need independence and engagement, emotional space and solitude to create their best work (Hill, 2000; Hill et al., 2014). Therefore, there arises the paradox of affirming the individual and the group (Amabile & Khaire, 2008; Hill, 2000; Hill et al., 2014). Ambidextrous organizations need to balance this paradox well to maximize individual creativity and group innovation.

Figure 2.5 visually displays the 10 paradoxes and their sub-factors.

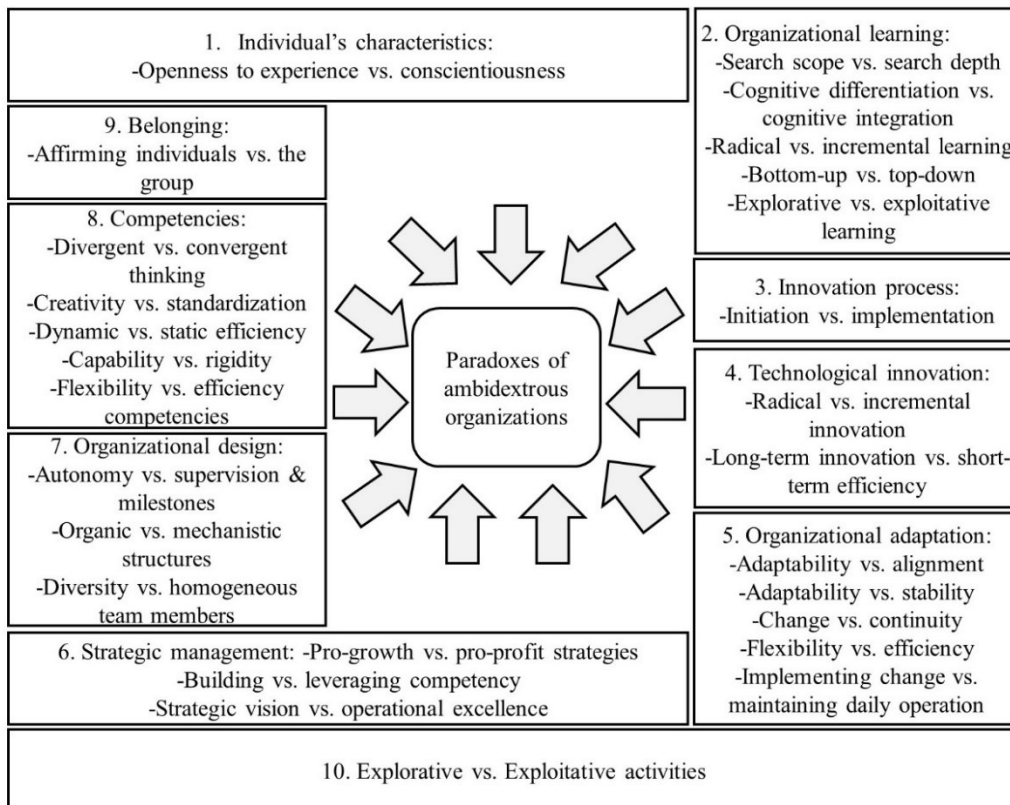


Figure 2.5 Paradoxes of Ambidextrous Organizations

2.6 Antecedent Factors of Organizational Ambidexterity

To be ambidextrous, organization management must juggle the conflicting demands of both exploitation and exploration, that facilitate organizational innovation and efficiency, in such a way that maximize the benefits of each of these dimensions concurrently, not to trade one off for another, nor just to compromise the conflicts for middle ground (Andriopoulos & Lewis, 2009; Gupta et al., 2006; Smith et al., 2017). Some scholars have proposed that organizations outsource or create alliances with external organizations, which is a complete physical separation of the contradictory activities or to temporally separate the two contradictory activities doing one part of the paradox at different points in time (Holmqvist, 2003; Lavie & Rosenkopf, 2006; Rothaermel & Deeds, 2004; Siggelkow & Levinthal, 2003). Raisch and Birkinshaw, (2008) posit that these solutions do not fall into ambidextrous management since they do not manage both activities simultaneously which is the defined characteristic of ambidexterity. But then again, Adler et al.'s (1999) and Birkinshaw and Hill's (2007) show that tension at one level of management is resolved by assigning each activity of ambidexterity to different units one level down the hierarchy. Based on this premise, it can be logically deducted that, in converse direction, the decision to outsource or create external alliances or to separate the activities temporally is the ambidexterity management of the manager one level up the hierarchy, who oversees the decision making for the separation. Such structural separation ensures that the configuration of each organization caters to the specific needs of its task environment (Burns & Stalker, 1961; Lawrence & Lorsch, 1967), but this separation creates coordination costs.

Some scholars are against inclusion of the external spatial and temporal separation as ambidextrous structure. They argue that ambidextrous management must involve exploration and exploitation in one same organization, and at the same time (Gibson & Birkinshaw, 2004; Tushman & O'Reilly III, 1996); because they are interdependence and must be strategically integrated to generate synergistic effects (Floyd & Lane, 2000). Only by such strategic integration of both exploration and exploitation will firms be able to build up dynamic capability and benefit from

ambidexterity (O'Reilly III & Tushman, 2004). They point out that strategic integration calls for a set of shared values, a shared vision, and a governance process.

Managing two inconsistent alignments such as exploration and exploitation within one same organization simultaneously is more complex than managing one consistent strategy sequentially or than externalizing one of these activities (Gupta et al., 2006). However, three broad approaches have been put forward as the solutions to pursue ambidexterity in organizations (Raisch & Birkinshaw, 2008). Based on the concept by Raisch and Birkinshaw, these approaches include: 1) structural ambidexterity which suggest maintaining a high level of both activities through internal separation of the two activities (Gupta et al., 2006; Lubatkin et al., 2006); 2) contextual ambidexterity that enables pursuance of the two activities within a single organizational unit (Gibson & Birkinshaw, 2004); and 3) leadership-based ambidexterity that holds the top management team responsible for managing the contradictory demands.

2.6.1 Structural Ambidexterity

Ambidexterity in organizational structures is enabled by creating structural mechanisms to address the paradox of alignment and adaptability (Gibson & Birkinshaw, 2004). For example, flexibility and cost efficiency can be achieved by task partitioning within a single business unit, where one group takes on an organic structure and another adopts a mechanistic structure. (Adler et al., 1999; Hedlund & Ridderstrale, 1997; McDonough & Leifer, 1986). Another idea indicates semi-structures in which organizational units can alternate between both requirements (Brown & Eisenhardt, 1997). Case in point, McDonald's Corporation specified seven structural factors for the solution of transnational corporation paradox, namely, fuzzy boundaries (which consists of both internal and external networks), learning and continuity (i.e. a system based on entrepreneurship and independent thinking), internal differentiation (using both formalization and socialization systems), structural indeterminacy (utilizing both radical decentralization for responsiveness and standardization for efficiency), integrative optimization (standardization for global efficiency and localization to meet local requirements), information intensity (which involves sharing information and knowledge), and latent linkages (which can emerge whenever shared decision making is needed) (Brouthers, Brouthers, & Sleeman, 1999). Aside from these, a range of

other structural solutions centers around spatial separation and parallel structures. In the spatial separation approach, the configuration of the organization is arranged in such a way that the units pursuing exploration are small, decentralized, coupled with loose processes, while units that pursue exploitation are larger, more centralized, and coupled with tight processes (Benner & Tushman, 2003; Tushman & O'Reilly III, 1996). Another structural solution suggested is temporal separation, where an entire unit focuses on different tasks in different periods (Adler et al., 1999; Duncan, 1976; McDonough & Leifer, 1986). Both approaches enable ambidexterity within a single business unit, and thus removes the coordination costs incurred from the above-mentioned outsourcing or alliance method (Gibson & Birkinshaw, 2004). By the structure differentiation, organizations can maintain different competencies necessary for the conflicting demands of ambidextrous (Gilbert, 2005).

In regard to the issue of separation, the question remains at how separated the contrasting units should be. And once the structure is separated, another question arises regarding how to integrate the units to synergize their efforts. Regarding the separation, some scholars argue in favor of shielding the explorative unit from the exploitative one by creating loosely coupled organizations (Leonard-Barton, 1992; Levinthal, 1997; Weick, 1976). And in the extreme case that organizations want to pursue disruptive innovation, Christensen (1998) suggests total separation of the contrasting units. Similarly, considering the different mindsets and skill sets and motivations required in the contrasting units, O'Reilly III and Tushman (2004) suggest the units to be physically and culturally separated from one another with each having its own incentive systems and management. Regarding the integration, O'Reilly III and Tushman posit that the senior management coordination and strong corporate culture is key to the integration across the units. One good example of the separation and integration effort was a case of five U.S. restaurant chains who displayed the simultaneous use of company and franchise units to balance company-wide alignment and adaptation to changing markets (Bradach, 1997).

There is yet another type of structure for ambidexterity, i.e. parallel structure. This is the organizational setup in which people switch back and forth between the two structures for exploitation and exploration according to the specific task requirements (McDonough & Leifer, 1986; Raisch & Birkinshaw, 2008). In this structural setup,

there is a formal primary structure for routine tasks, maintenance of stability and efficiency; and a secondary structure, such as project teams or networks, for non-routine tasks and innovation. These structures complement each other to ensure efficiency and stability of the organizations (Adler et al., 1999; Goldstein, 1985). This mechanism enables competing demands to be implemented within the same work unit (Gibson & Birkinshaw, 2004; Raisch & Birkinshaw, 2008).

2.6.2 Contextual Antecedents

Context refers to the systems, processes, and beliefs that shape individual-level behaviors in an organization (Ghoshal & Bartlett, 1994).

Gibson and Birkinshaw (2004) indicate contextual ambidexterity as the behavioral capacity to demonstrate simultaneous alignment and adaptability in organizations. Rather than creating dual structural arrangements, leaders are expected to create a supportive business-unit context. This context should be designed to enable and encourage all individuals to judge for themselves how to best divide their time between the conflicting demands for exploitation and exploration. For example, McDonough and Leifer (1986) illustrate the contextual antecedents as: 1) culture, which dictates the traditional way things get done, by which employees learn to recognize what constitutes appropriate behavior and what does not; 2) clan control, in which management superimpose organizational goals on individuals; 3) self-control, in which individuals set performance standards for themselves and then decide what action, if any, to take to correct deviations from these standards; and 4) feedforward control, in which individual behavior is controlled, or directed, in advance of work actually being done by conditioning the individual to act in a particular manner. which guide both explorative and exploitative activities. Similarly, several scholars specify other antecedents such as, meta-routines and job enrichment schemes (Adler et al., 1999); leaders with complex behavioral repertoires (Denison, Hooijberg, & Quinn., 1995; Lewis, 2000); and a shared vision (Bartlett & Ghoshal, 1989). However, Gibson and Birkinshaw (2004) claim that these antecedents covered only parts of the issue and fail to provide a sufficient context for ambidexterity. Based on earlier work by Ghoshal and Bartlett (1994), they suggest a combination of antecedents, such as stretch, discipline, support and trust to facilitate contextual ambidexterity. Their research study

on 41 business units supports the proposition that contextual antecedents have a positive correlation with ambidexterity and organizational performance.

2.6.3 Leadership-Based Antecedents

Leadership internal process is regarded as an element in facilitating organizational ambidexterity. Scholars propose that the top management team play a supporting role in implementing structural or contextual ambidexterity (Gibson & Birkinshaw, 2004; Smith & Tushman, 2005; Tushman & O'Reilly III, 1996). Nonetheless, an emergent group of scholars conceptualize leadership processes, themselves, as an independent antecedent of ambidexterity (Lubatkin et al., 2006). However, there are multiple streams of belief in this regard. For example, Floyd and Lane (2000) suggest that explorative activities occur at the operating level, producing innovative ideas for the top management to, exploitatively, select and leverage. At the same time, other scholars suggest that explorative and exploitative activities can occur simultaneously at the top management level, for example, top management bringing in new competencies to some units while utilizing well-developed competencies in others (Volberda et al., 2001); or top-management teams dynamically shifting their resources between on-going products and new innovation projects to support both simultaneously (Smith, 2006). In later years, researchers have investigated how top management team behave in the pursuance of ambidexterity. The findings reveal management team's cognitive and affective processes contribute to organizational ambidexterity, such as, the diverse composition and prior company affiliations business of the founding teams (Beckman, 2006); a good mixture of new comers and old timers in the management team (Peretti & Negro, 2006); behavioral integration (or the degree of senior management team's wholeness and unity of effort) which is shaped by the team's collaborative behavior, the quantity and quality of information exchanged, and the emphasis on joint decision making) (Lubatkin et al., 2006).

2.7 Research on Organizational Antecedents

2.7.1 Structural Ambidexterity Research Stream

Duncan (1976) suggests dual structures to manage the paradox by creating separate units that each pursue either exploitation or exploration. This ensures that each organizational unit is configured according to its task environment's specific requirements.

Leonard- Barton (1992), Levinthal (1997), and Weick (1976) suggest buffering explorative units from exploitative ones by separating and creating loosely coupled organizations of the two functions.

Tushman and O'Reilly III (1996) propose an antecedent of ambidexterity by setting up small, autonomous units with different structure, processes and culture from the main organization to undertake exploration activities.

Bradach (1997) did a field study of five U.S. restaurant chains and found the use of plural form—the simultaneous use of company and franchise units—to balance company-wide alignment and adaptation to changing markets.

Tushman and O'Reilly III (1996), and O'Reilly III and Tushman (2004) propose ambidextrous organizations to consist of multiple tightly coupled subunits that were themselves loosely coupled with one another. The contrasting units were physically and culturally separated from one another and have different incentive systems and the management.

Tushman (1997) illustrates the concept of spatial separation.

Christensen (1998) suggests that exploratory units need to be completely separated from exploitative units to be able to pursue disruptive innovation.

Benner and Tushman (2003), and Tushman and O'Reilly III (1996) specify that explorative business units should be small and decentralized with loose processes, in stark contrast with the larger and more decentralized, with tight processes.

2.7.2 Contextual Ambidexterity Research Stream

Bartlett and Ghoshal (1989) suggest the creation of a shared vision to guide the ambidextrous unit.

Ghoshal and Bartlett (1994) suggest four elements of contextual ambidexterity: stretch, discipline, support, and trust, a combination of which facilitates ambidexterity.

Adler, Goldoftas, and Levine (1999) suggest that efficiency and flexibility in the Toyota Production System was possible due to effective use of four organizational mechanisms that help shift the tradeoffs (meta-routines, job enrichment, switching, partitioning). First, meta-routines (routines for changing other routines) facilitate the efficient performance of non-routine tasks. In a TQM environment, production workers doing their regular production work tasks can be attentive simultaneously to the efficient implementation of routine production procedures and to the non-routine task of identifying improvement opportunities. Second, both workers and suppliers contribute to non-routine tasks while they work in routine production. Third, routine and non-routine tasks are separated temporally, and workers switch sequentially between them. Fourth, novel forms of organizational partitioning enable differentiated subunits to work in parallel on routine and nonroutine tasks. In this case the organization as a whole partitions itself to allow some subunits to specialize in routine tasks while other subunits specialize in non-routine tasks; when the importance of non-routine tasks increases, it becomes more cost-effective to do the partitioning. Finally, training and trust are considered critical contextual factors.

Gibson and Birkinshaw (2004) suggest contextual ambidexterity as creating a high-performance organizational context that enables individuals to choose how to divide their time between adaptability and alignment activities.

Mom, Van Den Bosch, and Volberda (2007) suggest that top-down knowledge inflows positively relate to exploitation activities, bottom-up and horizontal knowledge inflows positively relate to exploration activities.

Harrell, O'Reilly III and Tushman (2007) posit the strategic integration of explorative and exploitative activities as a mediator of ambidexterity and dynamic capabilities. Strategic integration requires a common set of values, a shared vision, and an overarching governance process.

Judge and Blocker (2008) suggest cultivating organizational capacity for change for organizations to become strategically ambidextrous, which is moderated by environmental uncertainty and organizational slack.

Raisch and Birkinshaw (2008, p. 396–397) elaborate:

choices about how to resolve the tension at one level of analysis are often resolved at the next level down. So, for example, a business unit may become ambidextrous by creating two functions or subdivisions with different foci, a manufacturing plant may become ambidextrous by creating two different teams (one in charge of enhancements to flexibility and another in charge of efficiency improvements), and a single team may become ambidextrous by allocating different roles to each individual.

Andriopoulos and Lewis (2009) posit paradoxes need to be managed across organizational levels because integration and differentiation tactics speak to paradoxical tensions and enable ambidexterity.

Bledow et al., (2009); and Verloop and Wissema, (2004) state that divergent thinking increases variability in ideas, which enhanced the idea generation, whereas convergent thinking reduces variability of ideas, which supported the implementation of innovation.

Cao, Gedajlovic, and Zhang (2009) posit that smaller firms with resource constraint are likely to benefit the most from achieving a close balance of exploration and exploitation.

Jansen et al. (2009) suggest that structural differentiation and integration mechanisms (senior team social integration and cross-functional interfaces) play a crucial role in a firm's ability to pursue exploratory and exploitative innovation concurrently.

Rothaermel and Alexandre (2009) suggest a balance of internal and external technology sourcing as an antecedent of ambidexterity.

Markides and Oyon (2010) suggest that organizations can pursue dual business model only after self-inquiry as to how to develop the right organizational environment (in terms of culture, structures, incentives and people to be able to gain synergies and promote ambidexterity). In pursuing dual business model, setting up new companies with full autonomy is the way to go, but only with close watch over the strategy from parent company. Cooperation between the unit and parent is encouraged through common incentive and reward systems. CEO should be transferred from inside the organization to facilitate closer cooperation and active exploitation of synergies.

2.7.3 Leadership-Based Ambidexterity Research Stream

Denison et al. (1995), and Lewis (2000) suggest ambidextrous leaders with complex behavioral repertoires.

Tushman and O'Reilly III (1996) posit that ambidexterity is facilitated by the top-management team's internal processes.

Floyd and Lane (2000) suggest that explorative activities occur at the operating level, producing innovative ideas for the top management to, exploitatively, select and leverage.

Lewis, Welsh, Dehler and Green (2002) illustrate that findings in project management literature reflect inherent tensions in new product development, such as the need for autonomy and flexibility, as well as for supervision and formal milestones.

Volberda et al. (2001) suggest that explorative and exploitative activities can occur simultaneously at the top management level, for example, top management bringing in new competencies to some units while utilizing well-developed competencies in others.

He and Wong (2004) specify the need for managers to manage the tension between exploration and exploitation on a continuous basis.

O'Reilly III and Tushman (2004) put forth the concept of structural ambidexterity with leadership-based ambidexterity, i.e. structural separation of explorative and exploitative business units and tightly integrated top management team to coordinate across units. The top management team align and integrate the explorative and exploitative functions to manage the tensions between the two functions. In this

context, organizations can benefit from “cross-fertilization among units while preventing cross-contamination” (O’Reilly III & Tushman, 2004, p. 77).

Smith and Tushman (2005) propose structural separation, with top management team acting as the corporate glue at the point of the integration. Management team develops management skills to manage the contrasting demands of exploitation and exploration for the short-term efficiency and the long-term innovation.

Beckman (2006) posits that team composition is an important antecedent of firm ambidexterity. The diverse composition and prior company affiliations business of the founding teams facilitate ambidexterity.

Lubatkin, Simsek, Ling, and Veiga (2006) indicate top management team’s behavioral integration (or the degree of senior management team’s wholeness and unity of effort) as an antecedent of ambidexterity. The behavioral integration is shaped by the team’s collaborative behavior, the quantity and quality of information exchanged, and the emphasis on joint decision making.

Peretti and Negro (2006) propose a team composition with a mix of newcomers and old timers as an antecedent of ambidexterity.

Smith (2006) describes ambidexterity as ensuing from top-management teams dynamically shifting their resources between on-going products and new innovation projects to support both simultaneously.

Nemanich, Keller, and Vera (2007) indicate transformational leadership and organizational learning culture as conducive to ambidexterity in the ever-changing environment.

O’Reilly III and Tushman (2008) posit that ambidexterity is a leader’s capability in mobilizing existing organizational assets and competencies to consistently adapt to changing conditions. Structural ambidexterity and senior leadership team with cognitive and behavioral flexibility are complementary in executing ambidexterity.

Carmeli and Halevi (2009) suggest that top management teams enable and create contextual ambidexterity through behavioral integration and behavioral complexity. Contextual ambidexterity is a critical moderating condition for organizational ambidexterity.

Mom, Van Den Bosch, and Volberda (2007) propose that ambidextrous managers must host contradictions, are multitaskers, refine and renew their knowledge, and expertise.

O'Reilly III and Tushman (2011) indicate that organizational adaptation, which is an important antecedent of ambidexterity, lies in the ability of senior management to execute the variation-selection and retention process in order to accommodate the fitness of the organization with its environment.

Table 2.2 Antecedents Factors of Organizational Ambidexterity

Antecedent Factors of Ambidexterity	Propositions	Research Authors
1) Structural ambidexterity:		
Dual structures	Dual structures enable management of the paradox by creating separate units that each pursue either exploitation or exploration. This ensures that each organizational unit is configured according to its task environment’s specific requirements.	Duncan (1976)
Creating loosely coupled exploration units which are buffered against exploitation units	Organizations must create loosely coupled organizations in which the explorative units are strongly buffered against the exploitative units.	Leonard- Barton (1995); Levinthal (1997), Weick (1976)
Autonomous exploration units with suitable structure, processes and culture	Ambidextrous organizations set up small, autonomous units with different structure, processes and culture from main organization undertake exploration activities.	Tushman and O’Reilly III (1996)
Plural forms of business unit to adapt to changing markets	Some ambidextrous organizations use plural form—the simultaneous use of company and franchise units—to balance company-wide alignment and adaptation to changing markets.	Bradach (1997)
Physically and culturally different structure for exploration units	Ambidextrous organizations are consisted of multiple tightly coupled subunits that are themselves loosely coupled with one another. The contrasting units are physically and culturally separated from one another and have different incentive systems and managerial teams.	Tushman and O’Reilly III (1996);

Table 2.2 (Continued)

Antecedent Factors of Ambidexterity	Propositions	Research Authors
Physically and culturally different structure for exploration units	Ambidextrous organizations are consisted of multiple tightly coupled subunits that are themselves loosely coupled with one another. The contrasting units are physically and culturally separated from one another and have different incentive systems and managerial teams.	Tushman and O'Reilly III (1996); O'Reilly III and Tushman (2004)
Spatially separated business units	The research proposed the concept of spatial separation.	Tushman (1997)
Completely separated units to pursue disruptive innovation	Exploratory units need to be completely separated from exploitative units to be able to pursue disruptive innovation.	Christensen (1998)
Small exploration unit vs. larger exploitation units	Organizational units pursuing exploration are expected to be small and decentralized with loose processes, organizational units that pursue exploitation are expected to be larger, more decentralized, and with tight processes.	Benner and Tushman (2003); Tushman and O'Reilly III (1996)
2) Contextual ambidexterity:		
Shared vision	Create a shared vision to guide the ambidextrous unit.	Bartlett and Ghoshal (1989)
Diversity and cohesiveness in teams	Capitalizing on diversity and cohesiveness enables group performance	Smith and Berg (1987)
Contexts combining stretch, discipline, support and trust	Create contexts characterized by a combination of stretch, discipline, support, and trust to facilitate contextual ambidexterity.	Ghoshal and Bartlett (1994)
Leaders with complex behavior repertoires	Ambidextrous leaders possess complex behavioral repertoires.	Denison et al. (1995); Lewis (2000)

Table 2.2 (Continued)

Antecedent Factors of	Propositions	Research Authors
<p>Ambidexterity</p> <p>Meta-routines, job-enrichment, switching modes, separated units</p>	<p>Efficiency and flexibility in the Toyota Production System was possible due to effective use of 4 organizational mechanisms that help shift the tradeoffs. First, meta-routines (routines for changing other routines): facilitated the efficient performance of non-routine tasks. In a TQM environment, production workers doing their regular production work tasks can be attentive simultaneously to the efficient implementation of routine production procedures and to the non-routine task of identifying improvement opportunities. Second, job enrichment: both workers and suppliers contributed to non-routine tasks while they worked in routine production. Third, switching: routine and non-routine tasks were separated temporally, and workers switched sequentially between them. Finally, partitioning: novel forms of organizational partitioning enabled differentiated subunits to work in parallel on routine and nonroutine tasks. (i.e. the organization as a whole partitions itself to allow some subunits to specialize in routine tasks while other subunits specialize in non-routine tasks; when the importance of non-routine tasks increases, it becomes more cost-effective to do the partitioning). Training and trust are critical contextual factors.</p>	<p>Adler, Goldoftas, and Levine (1999)</p>

Table 2.2 (Continued)

Antecedent Factors of Ambidexterity	Propositions	Research Authors
Creating context facilitating ambidexterity	Contextual ambidexterity is creating a high performance organizational context that enables individuals to choose how to divide their time between adaptability and alignment activities.	Gibson and Birkinshaw (2004)
Omni-directional knowledge inflows	Top-down knowledge inflows positively relate to exploitation activities, bottom-up and horizontal knowledge inflows positively relate to exploration activities.	Mom, Van Den Bosch, and Volberda (2007)
Strategic integration through shared values, a shared vision.	Ambidexterity only becomes a dynamic capability if the firm's exploitation and exploration activities are strategically integrated. Strategic integration requires a common set of values, a shared vision, and an overarching governance process.	O'Reilly III and Tushman (2007)
Building organizational capacity for change	Key means by which an organization becomes strategically ambidextrous is by cultivating organizational capacity for change, which is moderated by environmental uncertainty and organizational slack.	Judge and Blocker (2008)
Divergent and convergent thinking practices	Divergent thinking increases variability in ideas, which enhance the idea generation, whereas convergent thinking reduces variability of ideas, which supports the implementation of innovation.	Bledow et al., (2009); Virloop and Wissema, (2004)
Ambidexterity across all levels	Paradoxes need to be managed across organizational levels because integration and differentiation tactics address paradoxical tensions and enable ambidexterity.	Andriopoulos and Lewis (2009)

Table 2.2 (Continued)

Antecedent Factors of Ambidexterity	Propositions	Research Authors
Ambidexterity across all levels	Paradoxes need to be managed across organizational levels because integration and differentiation tactics address paradoxical tensions and enable ambidexterity.	Andriopoulos and Lewis (2009)
Balance of exploration and exploitation in small firms	Firms that are relatively resource constrained due to their small size or scarce-operating environments benefit the most from achieving a close balance of exploration and exploitation.	Cao, Gedajlovic, & Zhang (2009)
Structural differentiation with socially integrated senior teams and cross-functional interfaces	Structural differentiation and integration mechanisms (senior team social integration and cross-functional interfaces) play a crucial role in a firm's ability to pursue exploratory and exploitative innovation concurrently.	Jansen, Tempelaar, van den Bosch, & Volberda (2009)
Balance of internal and external technology sourcing	Enhanced firm performance requires a balance between internal and external technology sourcing of known as well as new technology.	Rothaermel and Alexandre (2009)
Separation of structure with close cooperation with parent organization	In pursuing dual business model, setting up new companies with full autonomy is the way to go, but only with close watch over the strategy from parent company. Cooperation between the unit and parent is encouraged through common incentive and reward systems. CEO should be transferred from inside the organization to facilitate closer cooperation and active exploitation of synergies.	Markides and Oyon (2010)

Table 2.2 (Continued)

Antecedent Factors of Ambidexterity	Propositions	Research Authors
3) Leadership-based ambidexterity:		
Top management team's internal process	Top-management team's internal processes facilitate ambidexterity.	Tushman and O'Reilly III (1996)
Middle managers facilitate exploration, top management facilitate exploitation	Exploration is related to the operating levels where managers experiment with novel solutions to emerging problems and the subsequent exploitation to the top-management levels where promising solutions are selected and leveraged.	Floyd and Lane (2000)
Development and Utilization of competencies	Management explicitly balance exploration and exploitation by bringing in new competencies to some units while utilizing well-developed competencies in others.	Volberda et al. (2001)
Balance of autonomy and flexibility vs. supervision and formal milestones	Findings in project management literature reflect inherent tensions in new product development, such as the need for autonomy and flexibility, as well as for supervision and formal milestones	Lewis, Welsh, Dehler, and Green (2002)
Managing ambidexterity on a continual basis	Managers need to manage the tension between exploration and exploitation on a continuous basis.	He and Wong (2004)

Table 2.2 (Continued)

Antecedent Factors of Ambidexterity	Propositions	Research Authors
Leaders as ‘corporate glue’	Structural ambidexterity must be accompanied by leadership-based ambidexterity: Explorative and exploitative business units are separated but tightly integrated by top management team coordinating across units. Top management team act as the “corporate glue” integrating the organization by managing tensions between exploitation and exploration enabling cross-fertilization among units while preventing cross-contamination”	O’Reilly III and Tushman (2004)
Structural differentiation with top management as point of integration	Structural differentiation is implemented with top management team as the point of integration. Senior team develops cognitive capacity to balance contradictions that stem from the tension between short-term efficiency (exploiting) and long-term innovation (exploring).	Smith and Tushman (2005)
A proper mix of diversity and common prior affiliation	Team composition is important to firm ambidexterity. Founding teams with common prior company affiliations enhanced exploitation, whereas diverse prior affiliations encouraged exploration. A mix of common and diverse prior affiliations was conducive to ambidexterity.	Beckman (2006)
High level of behavioral integration of top management team	Top management team’s behavioral integration positively influences how managers deal with the contradictory knowledge processes of exploitative and exploratory orientations. Senior management team’s wholeness and unity of effort lead to organizational ambidexterity.	Lubatkin, Simsek, Ling, and Veiga (2006)

Table 2.2 (Continued)

Antecedent Factors of Ambidexterity	Propositions	Research Authors
A mix of new and old members	A mix between “newcomers” and “old timers” in team composition.	Peretti and Negro (2006)
Dynamic shift of resources between existing and new products	Top-management teams dynamically shift their resources between the existing products and innovations to support both simultaneously.	Smith (2006)
Transformational leadership	Transformational leadership behaviors and the values of a learning culture promote ambidexterity in a context of change.	Nemanich, Keller, and Vera (2007)
Structural ambidexterity and senior leadership team with cognitive and behavioral flexibility	Ambidexterity is a capability embedded in leaders’ learning and expressed through an ability to reconfigure existing organizational assets and competencies in a repeatable way to adapt to changing conditions. Structural ambidexterity and senior leadership team with cognitive and behavioral flexibility are necessary.	O’Reilly III and Tushman (2008)
Assigning exploration and exploitation function to different parties or persons in the same work unit	Raisch and Birkinshaw (2008, p. 396–397) elaborate: choices about how to resolve the tension at one level of analysis are often resolved at the next level down. So, for example, a business unit may become ambidextrous by creating two functions or subdivisions with different foci, a manufacturing plant may become ambidextrous by creating two different teams (one in charge of enhancements to flexibility and another in charge of efficiency improvements), and a single team may become ambidextrous by allocating different roles to each individual.	Raisch and Birkinshaw (2008)

Table 2.2 (Continued)

Antecedent Factors of Ambidexterity	Propositions	Research Authors
Top management team's behavioral integration and behavioral complexity	Top management teams enable and create organizational ambidexterity through behavioral integration and behavioral complexity.	Carmeli and Halevi (2009)
Managers' multitasking, refinement and renewal of knowledge and expertise, embracing contradictions	Ambidextrous managers must host contradictions, are multitaskers, refine and renew their knowledge, and expertise.	Mom, Van Den Bosch, and Volberda (2009)
Managing ambidexterity while maintaining ecological fitness with environments	Organizational adaptation is a function of the variation selection-retention process occurring across business units; and of the ability of senior management to regulate this process in a way that maintains the ecological fitness of the organization with its environment.	O'Reilly III and Tushman (2011)

2.8 Conceptual Framework

The review of research produced a list of 40 antecedents of organizational ambidexterity as per Table 2 above. These antecedents fall into 3 major categories of antecedent factors, namely, structural ambidexterity (Benner & Tushman, 2003; Christensen, 1998; Duncan, 1976; Tushman & O'Reilly III, 1996) contextual ambidexterity (Ghoshal & Bartlett, 1994; Gibson & Birkinshaw, 2004; Raisch & Birkinshaw, 2008) and leadership-based ambidexterity (Carmeli & Halevi, 2009; Lubatkin, Simsek, Ling, & Veiga, 2006; Nemanich, Keller, & Vera, 2007; O'Reilly III & Tushman 2004). Further, the synthesis of the antecedents yields a fewer number of sub-category factors in each category.

In the structural antecedent category, three sub-category factors are synthesized, namely, spatial separation of structure, temporal separation and parallel structure.

In the contextual antecedent category, nine sub-category factors took shape, such as, 1) change management; 2) consistency in managing ambidexterity across all levels and over time; 3) team mixture of diverse and shared background; a mix of old and new comers in teams; diversity and cohesiveness of team members; 4) omni-directional knowledge flows; 5) balancing mechanism (focusing on stretch, discipline, support and trust; meta routine, job enrichment, temporal separation of exploration and exploitation tasks, partitioning contradictory tasks); 6) shared vision and values; 7) balanced usage of existing and new competencies; 8) divergent and convergent thinking; and 9) balance of internal and external technology sourcing.

And in the leadership-based antecedent category, eight sub-category factors emerged: 1) autonomy and supervision; 2) internal promotion and transfer of CEO to new separated exploration companies; 3) leader's cognitive and behavioral flexibility; 4) leader's tolerance for contradiction; 5) behavioral complexity and integration of management team; 6) leader's diverse knowledge, expertise and flexibility; 7) organizational adaptation with ecological fitness with its environment; and 8) transformation leadership.

All the above-mentioned factors are shown in Figure 2.6.

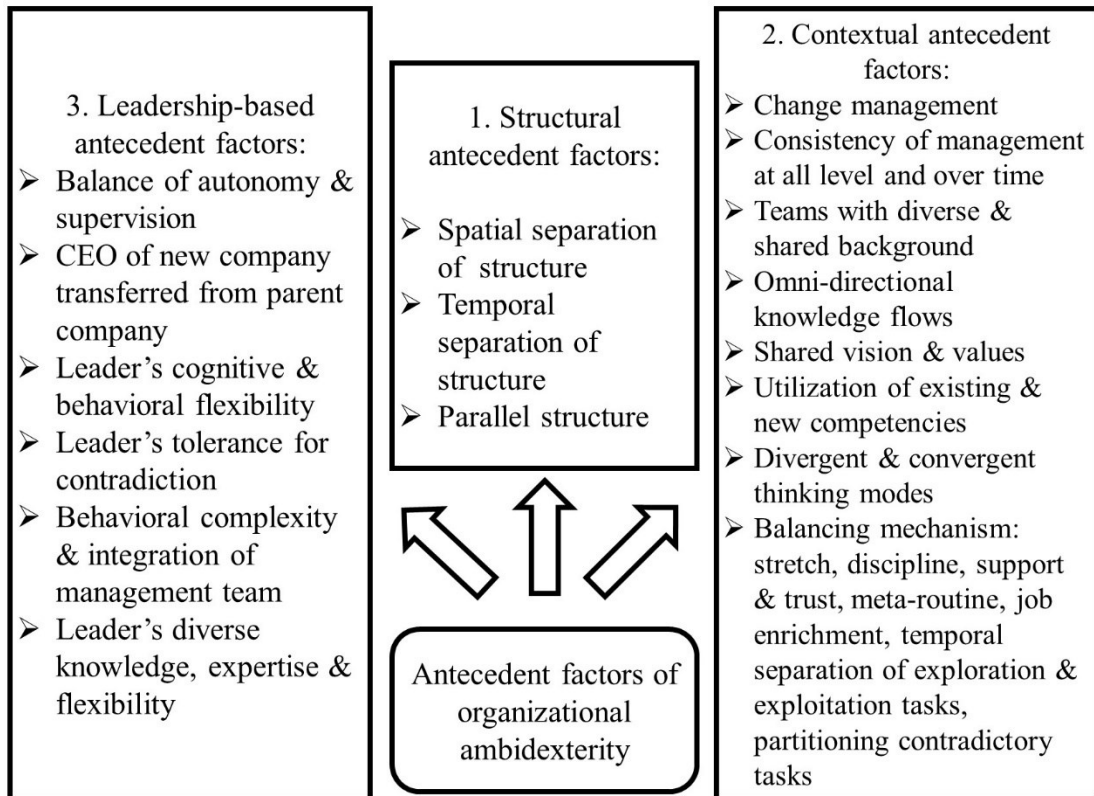


Figure 2.6 The Antecedents Factors of Organizational Ambidexterity

The **three** antecedent categories with their sub-category factors are anticipated to solve the afore-mentioned ambidextrous paradoxes and thus warrant iHPOs. This notion is believed to capture the essence of ambidextrous management and thus form the conceptual framework of this dissertation research. (See figure 2.7)

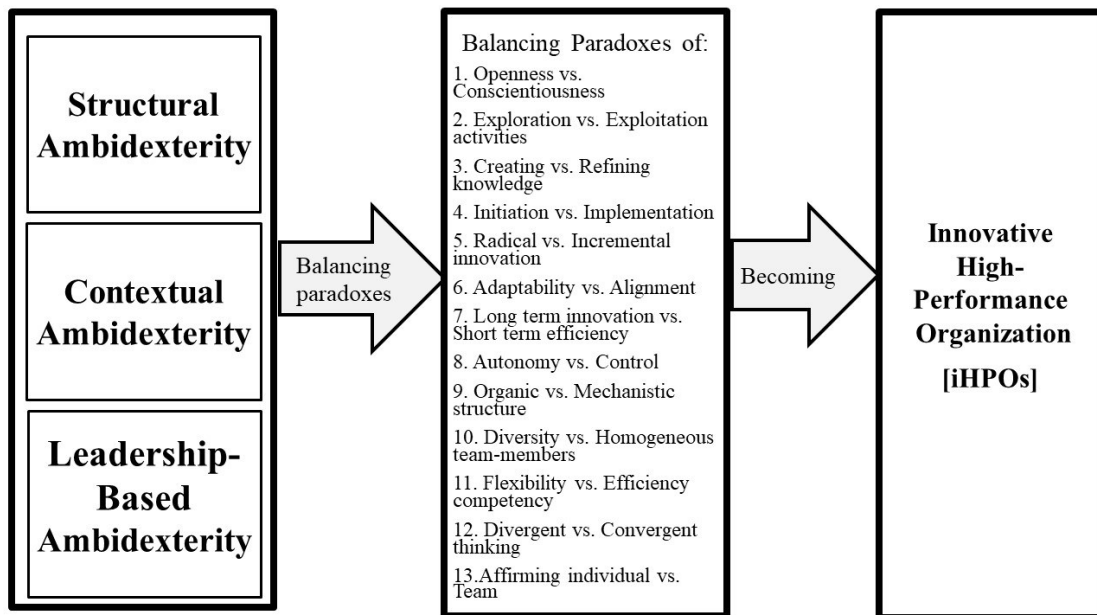


Figure 2.7 Conceptual Framework for Organizational Ambidextrous Management

CHAPTER 3

RESEARCH DESIGN AND METHODS

This chapter presents the research design and methods of this dissertation. Included in this chapter are the research design, scope of the study, data collection, and data analysis.

3.1 Research Design

This research opted for qualitative approach and the case study research as the methodology of study. The rationale for the choice is described as follows:

A qualitative approach is widely deemed effective in bringing depth and richness to a study of leadership (Conger & Toegel 2002). And it can produce in-depth understanding of a situation of complexities, as well as of phenomena that are little known; it can be used in research that explores cultural explanation, research that unearths tacit knowledge, or research on informal and unstructured linkages and processes in organizations (Creswell, 1994; Gall, Gall, & Borg, 2003; Lincoln & Guba, 1985). Out of the five methodologies in the qualitative approach (Creswell, 2013), case study research is chosen as the methodology owing to it being the process of inquiry that enables researchers to gain greater understanding of complex situations through a combination of up to six data collection methods: Interviews, direct observation, documentary research, archival records, participant observation and physical artifacts (Yin, 2009, 2012). Moreover, to further strengthen the efficacy of case study research methodology, multiple cases can be employed in place of just one single case (Yin, 2012). The multiple-case study, though more difficult to implement, can provide even more detailed findings because it allows the researcher to gain more insight from a variety of sites of study concerning a particular situation (Creswell, 2002; Yin, 2009). It will also facilitate the discernment of similarities and differences, as well as the comparison of the findings across cases (Parkhe, 1993).

This research aimed to study innovation and organizational ambidexterity which is just emerging as a paradigm within the field of organizational studies (Raisch, Birkinshaw, Probst, & Tushman, M. L., 2009; O'Reilly III & Tushman, 2013) and is still under-explored even in the western hemisphere (Asif, 2017). These are clearly the signs of being little known phenomena needing in-depth investigation and thus rightly call for qualitative approach and multiple case study research methodology.

3.2 Scope of the Study and Participants

“The idea behind qualitative research is to purposefully select participants or sites that will best help the researcher understand the problem and the research question” (Creswell, 2008, p. 178). This clearly designated purposive sampling method (also referred to as criterion sampling method) as the method of choice for the selection of both the case companies and the participant in this research. This notion concurs with that of Kumar (2011) indicating that in qualitative research, purposive/criterion sampling method ensures the best fit of the participants in terms of knowledgeable in the issues of the investigation, the characteristics or the accessibility of the respondents. Following this stream of concepts, this research opted for purposive/criterion sampling as its method for sample selection.

3.2.1 The Scope of the Case Study

This study was to explore the antecedent factors conducive to innovation in high-performance organizations. Therefore, the criteria for the case companies were first and foremost, being high-performance organizations over a long period of time. Second, they had to show proof of being innovative. And third, due to the limited time for this study, these companies had to be located near the residence of the researcher, i.e. in Bangkok or the metropolitan areas. Hence, initially, the population of the study had been planned to focus on the listed companies in the Stock Exchange of Thailand (SET) and the Market for Alternate Investment for SMEs (MAI). This would enable easy access to the corporate performance data which were publicly and conveniently posted on the SET/MAI website. And as a proof for being innovative companies, the

case companies had to win an innovation award from a public agency, such as National Innovation Agency (NIA) Most Innovative Organization Awards, and SET Best Innovative Company Awards etc. And in the case the number of sample companies from these sources were insufficient, the population were to be expanded to include non-SET listed companies that were generally considered high-performance and innovative.

The number of case companies for the study was set at 15 or more. The researcher obtained a list of 20 award winners and short-listed companies for NIA and SET Best Innovation Awards. Among these, 15 companies were on the Best Company Performance Award Preliminary List, the criteria of which were having been consistently profitable for the last three years consecutively and with shareholder's equity in the black for three years in a row. The researcher contacted these companies by phones and e-mails, finally nine companies consented to participate in the study; the response rate was calculated at 60.0%. Since the number of case companies did not reach the targeted number, the population thus was expanded to cover the companies outside of the SET/MAI, that were evidently recognized as high performance organizations outside of the SET/MAI, who also received an innovation award from public agencies. The criteria for being high-performance was specified as being in business for at least twenty years with growing company sizes over these years, and the same criteria for SET/MAI Best Company Performance Award Preliminary List were used in the selection. Eventually, nine companies were selected that had been in operations between 21-100 years. In total 18 companies participated in the research study.

3.2.1.1 Details of Criteria

1) Criteria for NIA-SET Most Innovative Organization Awards

The National Innovation Agency (Public Organization) or NIA together with SET, MAI and the College of Management, Mahidol University had jointly implemented Total Innovation Management Awards 2017.

Candidates for the award were selected through evaluations based on visits, presentations and talks relating to their innovation culture, as well as discussions and exchange of ideas with the executives of the applicants listed on the

Stock Exchange of Thailand (SET) and the Market for Alternate Investment for SMEs (MAI). The selection criteria included: 1) leadership, strategic planning based on innovation, 2) effective organizational structure, 3) support and promotion of innovation-based activities within the organization, 4) facilitation of an effective environment for innovation, 5) development of networks, 6) fostering of a culture of innovation, and 7) development of the knowledge base and employee care. (Stock Exchange of Thailand & Market of Alternate Investment, 2018).

2) Criteria for SET Best Innovative Company Awards

Best Company Performance Award list of candidates were screened from all SET/MAI listed companies. The selection criteria were 1) being active and legitimate listed companies; 2) having been consistently profitable for the last three years consecutively; and 3) having shareholder's equity in the black for three years in a row (Stock Exchange of Thailand & Market of Alternate Investment, 2018).

3.2.2 The Scope of the Participants

The focal companies of this study were entrusted with the selection of interviewees by themselves, because they were the ones who knew best about the companies. Nonetheless, the case companies had to follow the pre-requisite criteria laid out by the researcher to guide the right selection process. The criteria required the interviewees to be in R&D or innovation-related functions, with office tenure of at least three years to adequately understand the culture, context and systems in the organizations. Preferably two participants at each company were requested, one senior management staff and one frontline manager. The senior management refers to a person who were in a position to make decisions concerning the company's policy as well as the direction of the organization. Frontline managers were specified as those staff in supervisory functions of the day to day operation. In the case that focal companies allowed only one participant for the research, a senior manager level would serve the purpose. Eventually, fifteen executives were nominated by the company, one from each.

3.3 Data Collection

3.3.1 Primary and Secondary Data Collection

Case study research is the only methodology that allows usage of multiple data sources which offer the convenience of comparing information across the sources for data triangulation (Duneier & Cater, 1999; Yin, 2009). Yin (2009, p. 101) specifies the most commonly used sources for evidence in case studies as: “documentation, archival records, interviews, direct observations, participant-observation, and physical artifacts.”. According to Gillham (2000), and Yin (2009), it is the key strength of case study research to utilize multiple sources of information. Data collected from multiple sources are typically useful in the data triangulation process (Merriam, 1998; Yin, 2009).

Among the specified data sources, this research utilized interviews, direct observations and document research as its main data collection methods. The other two data sources—archival records and participant-observation—were left out. This was because archival records were difficult to access owing to corporate confidentiality reasons (Yin, 2009). And it is characteristic of participant-observations to require active participation in the internal activities of the phenomena being explored (Yin, 2009), which was most unlikely to be allowed for this study, due to the confidentiality of internal information.

Interview was used because of its in-depth conversation style that could discover thoughts and feelings of interviewees at a deeper level (Fraenkel & Wallen, 2003). And it allows the researcher to collect a vast amount of information from the participants (Minichiello, Aroni, Timewell, & Alexander, 1995). Semi-structured interviews were used in the interviews which allowed the researcher to facilitate an open discussion during the interviews while probing into other contextual issues limited by a survey method (Creswell, 2008).

Direct observations (Yin, 2009) refer to observations of the behaviors or environments in its natural setting without the observer’s involvement in any activities taking place. They can be observations of meetings, factory work, physical structure, work climate including the physical artifacts, which is another data source indicated by

Yin (2009). Description memo will be taken during the observations with conceptual memo on the side (Glesne, 2011). The observation will also serve as a triangulation tool against data from interviews (Merriam, 1998). Other scholars refer to direct observations as nonparticipant observations (Mills, Durepos, & Wiebe, 2009), or merely, observations (Creswell, 2013).

Accordingly, direct observations of the visible artifacts, workplace atmosphere and the work surrounding were made during the visit at each company, the data of which were used for triangulation with the interview content analysis.

Documentation is another source of evidence whether in physical or digital forms (Yin, 2009). This data collection method was conducted early in the research and during the course of the case studies.

This documentary research was thoroughly done by the researcher prior to each interview, exploring all available documents regarding the case companies, especially all the digital information on the companies' website, SET website, and several other sources of corporate information.

Case study research is the only methodology that allows usage of multiple data sources which offer the convenience of comparing information across the sources for data triangulation (Duneier & Cater, 1999; Yin, 2009).

In sum, to enhance the trustworthiness of the findings, this research availed itself of the data triangulation method by comparing data from these various sources; specifically, those from the direct observations as mentioned above.

3.3.2 Pilot Study

Pilot study is important in developing meaningful interview questions (Lincoln & Guba, 1985; Marshall & Rossman, 2011); the scholars indicate that pilot studies are useful for trying out research strategies and in supporting an argument and rationale for a genre and strategy. In addition, Yin (2009) suggest conducting a pilot study to enable the researcher to refine the data collection plans and procedures.

In this research, a pilot study was conducted to check for the clarity and answerability of the interview questions; the appropriateness of the length of the interviews; and the effectiveness of the language and contents of the interview questions in enabling the researcher to probe and gain greater understanding of the

situation. As for the number of pilot study participants, Glesne (2011) argues that there is no consensus on the number of participants required for a pilot study. Nevertheless, the number and variability should be sufficient to allow the researcher to effectively explore the problems. The learning from the pilot study was applied in revising the interview protocol for better effect. The first three companies served as the pilot study companies, the interview results of which were excluded from the content analysis. Interview questions and the practices were revised and refined as a result of the learning in each interview and the interview questions were effectively revised and finalized for good use.

3.3.3 Interview Protocol

According to Yin (2009), an interview protocol is to develop for efficient conduction of interviews. The interview protocol was developed based on the research questions and the established conceptual framework, which enabled the researcher to obtain practical information related to the elements and process in the subject matter. The interview protocol focused on the following points:

- 1) What encourage and (what) discourage innovation?
- 2) What paradoxes/contradictions arise between innovation and efficiency?
- 3) How the paradoxes were solved?
- 4) Suggestions for the solutions for the paradoxes yet unsolved.

Each main question consisted of sub-questions and tentative probing questions. The interview began by asking interviewees about their perception or perceived understanding of innovation and its importance to the firm performance. Further, the interviewees were asked about their past projects and experiences related to innovation or creativity, together with examples of such tasks or activities. The interviewees were then asked to think about the antecedent factors that foster and hamper innovation and the paradoxes between innovation and efficiency management. Lastly, the interviewees were asked for ideas about the desired roles of leadership and senior management in facilitating ambidexterity in the organizations. In all these incidents, the term ambidexterity were avoided and replaced with the term the simultaneous management of innovation and efficiency.

In the interviews, participants were also asked about their demographic data such as, age, level of education, and work experience, etc.

Prior to the interviews, the interview protocol was finalized with the help and verification from three authorities in the field of research. The interview was conducted in a conversational manner and in line with the guiding questions. Each interview session was digitally recorded. Prior to each interview, the participants were informed about the objectives of the study, general information, and the benefit and risks of the study. Furthermore, the participants were informed of their right to not answer any questions if they might so desire.

The case companies were approached via e-mail, telephone or in person where appropriate to enlist their consents in participation in the study. The companies were all informed of 1) the objectives of the study; 2) the benefits of the study; and 3) the researcher's contact information.

3.4 Data Analysis

This study utilized individual in-depth interviews and nonparticipant observation as the main means to explore the research questions, where it was possible. Content analysis of the interviews transcription and the observation memo were conducted and open coding for each meaningful expression was generated from the transcripts independently. Codes were then grouped into categories with conceptual similarity, from which the themes were finally generated in line with Glesne (2011). Some codes and themes were compared with the findings from the observations and the document research for triangulation. To ensure the accuracy of the interview contents, it was imperative to transcribe and translate the texts before categorizing them for data analysis. In the translation process, all information from the participants were translated from Thai to English by a reliable translator.

3.5 Trustworthiness

The trustworthiness underlying this study was based on Lincoln and Guba's (1985) criteria. They suggest four types of trustworthiness criteria in conducting qualitative research, namely, 1) credibility (internal validity); 2) transferability (external validity); 3) dependability (reliability); and 4) confirmability (objectivity). Each of the criteria is explained in more detail as follows:

3.5.1 Credibility

Credibility seeks to ensure that the study measures or tests what the researchers intend to study. In other words, credibility deals with the accuracy of identifying the subject of the study (Lincoln and Guba, 1985). Thus, to enhance the credibility of this study, the researcher paraphrased participants' responses back to them to ensure that the researcher accurately captured the participants' thoughts. Furthermore, triangulation of the data was conducted by utilizing information from the multiple sources.

3.5.2 Transferability

Transferability concerns external validity. It is a criterion that measures applicability of findings of one study to another setting. Lincoln and Guba (1985) posit that in qualitative research, the readers are instrumental in determining whether the findings can be transferred or applied to other contexts or not. So, to assist the readers in deciding whether the findings are applicable in another context, the research provided the readers with rich and thick descriptions and vicarious accounts they need to determine if and how they will use the information in their own contexts (Mills, Eurepos, & Wiebe, 2009).

3.5.3 Dependability

Guba (1981) states that dependability refers to the consistency of findings. In other words, the results of the findings are consistent over time. In the quantitative area, researchers employ techniques to ensure that similar results are obtained when similar contexts are repeated. To ensure the dependability criterion of the study, participants were assured of the confidentiality of the interview before starting an interview session. In this manner, participants could feel psychologically safe to provide accurate information about particular issues.

In addition, during the data-collection phase, the researcher asked the participants by reframing the same questions in different words to ensure that they understood the questions correctly.

Lastly, in the data analysis phase, the researcher conducted a code-recode procedure. In other words, after the first coding was conducted, the researcher recoded the same data in order to compare the results of the first coding and the second coding.

3.5.4 Confirmability

Confirmability concerns the researcher's objectivity. It is a way to ensure that the results of the findings are derived from the participants, not the researcher's own perception or preferences. In this study, confirmability was enhanced by the bracketing of the researcher's assumptions about the particular topic of interest.

Bracketing is a process used in qualitative research to keep a distance from previous theories or assumption (Bertelsen, 2005; Tufford & Newman, 2010). Bracketing interviews can increase the capacity to understand the phenomena in question and increase the researcher's engagement with participants (Rolls & Relf, 2006). The researcher, accordingly, applied the bracketing technique when engaging in interviews from the standpoint of an outsider, so as to eliminate preconceptions and biases.

Additionally, the triangulation by multiple methods were employed to strengthen the findings. According to Lincoln and Guba (1985), triangulation allows a researcher to utilize multiple data sources to provide corroborating evidence. Additionally, in the interpretation phase, cross-checking for the accuracy of the interpretation was carried out to rid of bias in the process.

Apart from the criteria of trustworthiness, the researcher assessed the quality of the case study by using Stake's critique checklist. Stake (1995, p. 131) indicates 20 criteria checklists that assess the quality of the case study, as follows:

- 1) Is this report easy to read?
- 2) Does it fit together, each sentence contributing to the whole?
- 3) Does this report have a conceptual structure (i.e. themes or issues)?
- 4) Are its issues developed in a series and scholarly way?
- 5) Is the case adequately defined?
- 6) Is there a sense of story to the presentation?
- 7) Is the reader provided some vicarious experience?
- 8) Have quotations been used effectively?
- 9) Are headings, figures, artifacts, appendices, indexes effectively used?
- 10) Was it edited well, then again with a last-minute polish?
- 11) Has the writer made sound assertions, neither over nor under interpreting?
- 12) Has adequate attention been paid to various contexts?
- 13) Were sufficient raw data presented?
- 14) Were data sources well-chosen and in sufficient number?
- 15) Do observations and interpretations appear to have been triangulated?
- 16) Is the role and point of view of the researcher nicely apparent?
- 17) Is the nature of the intended audience apparent?
- 18) Is empathy shown for all sides?
- 19) Are personal intentions examined?
- 20) Does it appear individuals were put at risk?

Summary

In sum, the purpose of this qualitative research was to provide rich and informative findings that could explain the phenomena of interest. However, qualitative researchers must effectively deal with the effect of subjectivity in many cases, such as data collection bias and data interpretation bias (Patton, 1990).

This research coped with the points of concern by using various approaches. For example, for the data collection phase, the researcher employed as many sources as possible. The data from various sources, such as documents, the Internet, literature review, interviews, and observation, were used to strengthen the findings.

In addition, for the data analysis phase, the transcript was perused several times before the coding; and re-coding was executed to ensure the fit of codes in each category.

Lastly, for the data interpretation, direct quotations from the participants' discourse were utilized as much as possible to illuminate a point. And the findings were confirmed by triangulation of the data. The data from observations were also be included to confirm the interview findings.

The process of data collection and analysis is shown in Figure 3.1.

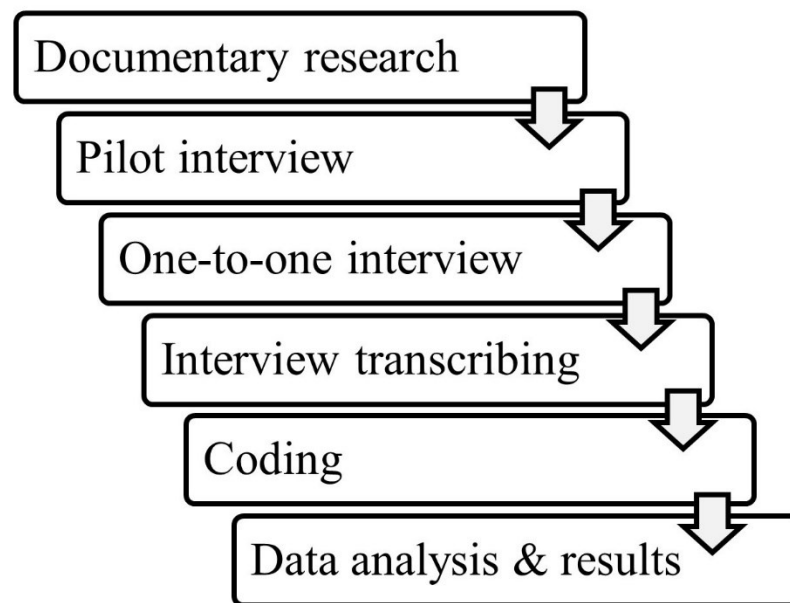


Figure 3.1 Data Collection and Analysis Process

3.6 Ethical Considerations

The ethical guidelines of the American Psychological Association (APA) was strictly followed in this study. Risks regarding participation in this study were of concerns and to be communicated to the participants.

Firstly, all of the participants were informed of the objectives of the interview as well as the expected duration and procedures. Furthermore, the participants were informed that they had the right not to answer questions that they do not feel comfortable with or questions that concerned the company's confidential information.

Secondly, all participants were informed that they could withdraw from the interview at any time even after it has begun.

Thirdly, every step of the data collection was executed with care to ensure that the participants felt comfortable answering the questions and participating in the interview.

CHAPTER 4

RESULTS OF THE QUALITATIVE INVESTIGATION

The purposes of this research were 1) to study the structural and contextual factors that enhance innovation in iHPOs; 2) to find the typical paradoxes of innovation vs. efficiency; and 3) to seek out the ambidextrous management and leadership practices that maximize innovation and efficiency concurrently.

The study aimed at answering the research questions through qualitative research approach with multiple case study methodology. Data were collected by individual semi-structured interviews, documentary research of the case companies and direct observation of the workplace environment and physical artifacts. This research methodology provided rich and in-depth information, shedding light on the research questions:

- 1) What are the structure, context, culture that enhance innovation in innovative and high-performance organizations?
- 2) What are the paradoxes encountered and overcome in achieving both innovativeness and efficiency (ambidexterity)?
- 3) How do these organizations manage for ambidexterity (innovation and efficiency)?
- 4) What is a possible ambidextrous model of innovative high-performance organizations in Thailand?

4.1 Details of the Case Study Companies and the Participants

Following are the collective details of case-study companies. Owing to the promise to maintain anonymity of the participating companies and the participants. Cautions are exercised to not give away the identity of either the corporations or the

participants. The table was formulated to give adequate information of all the companies without giving away the identity of each individual company.

Fifteen companies were recruited for this study. Seven companies were those listed on Thailand SET or MAI, while the rest were non-listed companies who were well regarded in their respective fields for their innovative products and services; and evidently displayed high business performance. All interviewees were high-ranking executives with good insights of the innovation in their companies. The years in operation of these companies ranged from 20-100/+ years. And the sales revenue ranged from 300 million Baht – 100,000/+ million Baht. The companies were classified in three groups according to the sizes of their innovation facility: Group-1 are the companies with big innovation staff of 50-100 persons; Group-2: medium innovation staff of under 50 persons; and Group-3: high-tech and IT with no explicitly dedicated staff for innovation but everyone was involved in innovation because of the nature of business.

Ten companies were in manufacturing and production, and five companies were in high-tech and IT. When considered from the types of business, they were in food, industrial products, chemical products, high-tech and IT, retailing with own manufacturing facility, and media production. (See Table 4.1)

Table 4.1 Details of Companies in the Study

Company Description	Number of Companies
Innovation facility	
Group-1: Big innovation staff (50-100/up)	5
Group-2: Medium innovation staff (under 50 staff)	5
Group-3: High-tech & IT (no dedicated staff)	5
Type of industry	
Manufacturing and production	10
Hi-tech & IT	5
Type of business	
Food	2
Industrial products	3
Chemical products	3
Hi-tech & IT	5
Manufacturing & Retailing	1
Media production	1
Sales volume	
100,000+	5
10,000-30,000	3
1000-10,000	4
300-500	3
Years of operation	
20-29	4
30-39	3
40-49	3
50-59	1
60-69	1
90-100/up	3

There were 15 participants in total, one from each company. All were involved in the innovation activities and programs and have good insight of the innovation operation. The ages ranged from 25-30 to 60-65 years and the years of work in the companies ranged from five to 27 years. There were four female participants. Most of the participants were educated in STEM fields, with 3 non-STEM educated persons. Education levels ranged from bachelor's degree to Ph.D. with majority of 12 persons holding a Master's. These participants were referred to as Interviewee and identified by code names corresponding to their company's. (See Table 4.2)

Table 4.2 Participant Details

No.	Names	Gender	Age	Degree	Field of Study	Position	Function	Years of Work
1)	1-CA	M	60-65	Master's	STEM	Director of Innovation Center	Innovation Management	15
2)	1-CB	M	41-45	Master's	STEM	Assistant Managing Director	Innovation Management	12
3)	1-SA	M	46-50	Master's	Non-STEM	Manager	Organization Development	25
4)	1-SB	M	26-30	Bachelor's	Non-STEM	Supervisor	Innovation Center HR	5
5)	1-TA	F	46-50	Master's	STEM	Manager	R&D	5
6)	2-DE	M	46-50	Master's	Non-STEM	Managing Director	Business Unit	20
7)	2-NN	F	36-40	Master's	STEM	Manager	R&D	12
8)	2-PR	M	51-55	Bachelor's	STEM	Director	R&D	25
9)	2-SL	F	41-45	Master's	STEM	Manager	Business Development	10
10)	2-UI	M	36-40	Master's	STEM	Director	Management	8
11)	3-DI	F	36-40	Master's	STEM	Manager	IT	10
12)	3-GG	M	51-55	Master's	STEM	GM	IT	27
13)	3-IN	M	51-55	Master's	STEM	CEO	Management	19
14)	3-JJ	M	51-55	PhD.	STEM	CEO	Management	20
15)	3-LL	M	46-50	Master's	STEM	GM	IT	20

4.2 Methods of Data Collection and Analysis

In-depth interviews, documentary research and direct observations, were used as the methods for data collection. At each company, one session of in-depth interview of an innovation-related management was conducted. In-depth interview was used because of its in-depth conversation style that could reveal thoughts and feelings of interviewees at a deeper level (Fraenkel & Wallen, 2003). Each interviewee was specified by the organization following the researcher's requirement for an innovation-related management. This was done according to the purposive sampling method (Patton, 1990).

When possible, the direct observations of the premises, people and artifacts were conducted, to observe the overall atmosphere, employee behaviors, attitude and interactions at all levels, so as to see what patterns of leadership and organizational elements emerge in the natural setting (Creswell, 2013). Description memo was taken with conceptual memo on the side (Glesne, 2011). The observations were also used for triangulation of the data where relevant (Merriam, 1998).

As for the in-depth interviews, one interview session lasting about 1-hour each was conducted at each location, totaling 15 sessions. The interviews were conducted with participant consents and with the promise to keep the anonymity of each participant and the organization. The interviews were recorded with prior consents; and all the audio recording transcripts were carefully checked for accuracy by the researcher.

The purpose of the interviews was to collect data from the interviewees regarding the management and the leadership for innovation and ambidexterity. The interview schedule was generated (Glesne, 2011) based on the following research questions.

- 1) What are the structure, context, culture that enhance innovation in innovative and high-performance organizations?
- 2) What are the paradoxes encountered and overcome in achieving both innovativeness and efficiency (ambidexterity)?

3) How do these organizations manage for ambidexterity (innovation and efficiency)?

4) What is a possible ambidextrous model of innovative high-performance organizations in Thailand?

The interviews questions are formulated in line with the research questions and include questions as follows:

1) What is innovation in your organization. Please give some examples.

2) In your organization, what encourage and what discourage innovation?

3) Many innovation projects are successful, but some are not. Do you have examples of some of such failed projects? What were the causes for such project failures? If you could do it again, what would you do differently to ensure success?

4) Theoretically, innovation is a group effort, but also depends on the strength of each team member, how do you manage for the best of both dimensions?

5) Theoretically in managing for innovation, organizations must empower employees to think out of the box, encourage experimentation and risk taking; provide time and slack resources for innovation. These are, at times, paradoxical with the management for performance which emphasizes minimized input for maximum outputs, minimizing cost, working against deadlines, following rules and standards.

(1) In your organization, are there any such paradoxes? Can you raise some example? And how does your organization manage the paradoxes?

(2) What leadership are necessary in managing innovation and the performance simultaneously?

And to strengthen the trustworthiness of the findings from the interviews, when possible, observation was conducted for a triangulation with the findings from the interviews.

Inductive category development by counting the frequency of occurrences of a topic (Mayring, 2004) was used in this study. This method prevents using preconceived categories formed from literature review and reduces researcher's bias (Kondracki & Wellman, 2002).

In order to analyze the qualitative data, the interview recordings were transcribed, and the descriptive memo of the direct observation was carefully studied. Content analysis of the transcription and the observation memo were thoroughly carried

out and open coding for each meaningful expression was generated from the transcripts independently. Codes were then grouped into categories with conceptual similarity, from which themes were eventually generated (Glesne, 2011). The codes and themes were then compared with the findings from the direct observation and the documentary research for triangulation.

In accordance with the coding method set out by Glesne (2011), the coding process were executed in this order: 1) analyzing the interviews and capturing meaningful expressions from interviews. 2) assigning a code to each meaningful expression. 3) grouping similar codes together into a category. and 4) grouping similar categories together into a theme.

4.3 Study Findings

The interviews were carried out in order to find the data that answer these research questions.

1) What are the structure, context, culture that enhance innovation in innovative and high-performance organizations?

2) What are the paradoxes encountered and overcome in achieving both innovativeness and efficiency (ambidexterity)?

3) How do these organizations manage for ambidexterity (innovation and efficiency)?

4) What is a possible ambidextrous model of innovative high-performance organizations in Thailand?

The research findings were compiled from an analysis of the data from the interviews, direct observation and documentary research.

In the following section, the terms innovation, product development, new product development, and project were commonly used interchangeably.

4.3.1 Research Question 1: “What are the Structure, Context, Culture that Enhance Innovation in Innovative and High-Performance Organizations?”

The antecedent factors enhancing innovation discussed in this research question were those related to structure, organizational context, organizational climate and culture, leadership and management.

The interview data analysis yielded 379 meaningful expressions which were grouped into 80 codes. These codes were then grouped into 30 categories which were again grouped into eight themes. These themes are described as follows: 1) structure, 2) systems-process-tools, 3) staff, 4) human resource development (HRD), 5) leadership, 6) organizational climate and culture, 7) knowledge, and 8) external environmental elements.

Table 4.3 displays all the themes and the categories of antecedent factors of innovation of all the company groups, as well as the frequency counts of each code.

Table 4.3 Antecedent Factors Enhancing Innovation

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
Themes 1: Structure									
1) Flat structure	Flat structure	9	53.3	3	60.0	3	60.0	3	60.0
2) Cross-functional project teams	Cross-functional project teams	11	73.3	4	80.0	2	40.0	5	100.0
3) Internal spatial separation of structure	Internal spatial separation of structure	11	73.3	5	100.0	5	100.0	1	20.0
	Total counts	31		12		10		9	
	% of total counts	100		38.7		32.3		29	
Theme 2: System-process-tool									
1) Mechanism/tool for idea generation	Specialized idea generation methodology/process	3	20.0	3	60.0	0	0.0	0	0.0
2) Mechanism/means for motivation to innovate	Innovation contest	6	40.0	5	100.0	1	20.0	0	0.0
	Knowledge sharing session	2	13.3	0	0.0	1	20.0	1	20.0
	Commercial success of the new products	2	13.3	1	20.0	0	0.0	1	20.0
	Rewards and recognition for innovation	4	26.7	3	60.0	1	20.0	0	0.0
	Total counts	17		12		3		2	
	% of total counts	100		70.6		17.6		11.8	

Table 4.3 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
Theme 3: Staff-related elements									
1) Knowledge and skills	Functional expertise	11	73.3	4	80.0	2	40.0	5	100.0
	Ideation fluency	5	33.3	2	40.0	1	20.0	2	40.0
	Flexibility and adaptability skills	4	26.7	2	40.0	2	40.0	0	0.0
	Good teamwork skills	5	33.3	1	20.0	2	40.0	2	40.0
2) Attitudes for innovation	Affection for creating new things	3	20.0	0	0.0	2	40.0	1	20.0
	Curiosity, inquisitiveness, passion	4	26.7	2	40.0	1	20.0	1	20.0
	Open-mindedness	3	20.0	1	20.0	1	20.0	1	20.0
	Challenging the status quo	5	33.3	2	40.0	1	20.0	2	40.0
	Achievement orientation	5	33.3	1	20.0	2	40.0	2	40.0
	Taking responsibility and committed to his job	6	40.0	0	0.0	2	40.0	4	80.0
3) Learning	Affection for learning	6	40.0	2	40.0	1	20.0	3	60.0
	Self-learning	5	33.3	0	0.0	3	60.0	2	40.0
	Learning from mistakes	5	33.3	2	40.0	1	20.0	2	40.0
	Keeping pace with the latest technology	9	60.0	1	20.0	3	60.0	5	100.0
	Total counts	76		20		24		32	
	% of total counts	100		26.3		31.6		42.1	

Table 4.3 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
Theme 4: HRD and HRM									
1) Learning & development	Coaching	3	20.0	1	20.0	1	20.0	1	20.0
	Job rotation	2	13.3	1	20.0	0	0.0	1	20.0
	Technological competency development	3	20.0	1	20.0	1	20.0	1	20.0
	Development of communication and socialization skills	2	13.3	1	20.0	0	0.0	1	20.0
	Development of creativity skills	2	13.3	2	40.0	0	0.0	0	0.0
2) Effective talent recruitment practices	Competency based recruitment	3	20.0	0	0.0	1	20.0	2	40.0
	Total counts	15		6		3		6	
	% of total counts	100		40		20		40	
Theme 5: Leadership									
1) Showing support for innovation	Showing support for innovation	7	46.7	3	60.0	2	40.0	2	40.0
2) Emphasis on teamwork	Nurturing teamwork, trust and collaboration	6	40.0	1	20.0	2	40.0	3	60.0
3) Showing passion and/or involvement in innovation	Showing passion and/or involvement in innovation	12	80.0	4	80.0	3	60.0	5	100.0
4) Pragmatism	Action-oriented	2	13.3	1	20.0	1	20.0	0	0.0
	Evidence-based judgement	5	33.3	2	40.0	2	40.0	1	20.0

Table 4.3 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
5) Risk-taking	Risk-taking	5	33.3	2	40.0	1	20.0	2	40.0
	Tolerance for failures	3	20.0	1	20.0	2	40.0	0	0.0
6) Openness	Being accessible to team members	5	33.3	1	20.0	2	40.0	2	40.0
	Open-mindedness	6	40.0	1	20.0	2	40.0	3	60.0
7) Competencies	Being visionary and communicating the vision	7	46.7	3	60.0	1	20.0	3	60.0
	Good networking	4	26.7	1	20.0	1	20.0	2	40.0
	Adaptability to changes in task environment	6	40.0	2	40.0	3	60.0	1	20.0
	Empowering	6	40.0	2	40.0	2	40.0	2	40.0
8) Cognitive ability	Having broad perspectives	3	20.0	2	40.0	0	0.0	1	20.0
	Awareness of the latest business trends	5	33.3	0	0.0	1	20.0	4	80.0
9) Transformational leadership	Inspirational stimulation, being visionary	6	40.0	3	60.0	1	20.0	2	40.0
	Challenging followers intellectually	1	6.7	0	0.0	0	0.0	1	20.0
	Individualized consideration for followers	1	6.7	0	0.0	1	20.0	0	0.0
	Influencing and persuasion	1	6.7	0	0.0	1	20.0	0	0.0

Table 4.3 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
10) Key facilitators for innovation	Innovation champion	4	26.7	2	40.0	2	40.0	0	0.0
	Boundary spanning function	2	13.3	2	40.0	0	0.0	0	0.0
	Gatekeeper function	2	13.3	1	20.0	1	20.0	0	0.0
	Total counts	99		34		31		34	
	% of total counts	100		34.3		31.3		34.3	
Theme 6: Climate and culture									
1) Psychological safety	Freedom to express ideas & debate	6	40.0	1	20.0	2	40.0	3	60.0
2) Diversity	Including various functions in teams	3	20.0	2	40.0	1	20.0	0	0.0
3) Organizational support	Support for opportunities and resources	13	86.7	5	80.0	3	20.0	5	100.0
4) Collaborative atmosphere	Breaking down silos	3	20.0	1	20.0	1	20.0	1	20.0
	Good co-ordination between functions	7	46.7	3	60.0	3	60.0	1	20.0
	Frequent meetings	2	13.3	1	20.0	0	0.0	1	20.0
	Organization-wide participation	3	20.0	1	20.0	0	0.0	2	40.0
	Showing trust in followers	4	26.7	1	20.0	1	20.0	2	40.0
	Helping out other members	3	20.0	0	0.0	1	20.0	2	40.0
	Friendly atmosphere	4	26.7	1	20.0	2	40.0	1	20.0
	Open space and modern looking work surrounding	3	20.0	1	20.0	1	20.0	1	20.0

Table 4.3 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
5) Experiment-orientation	Experiment-orientation, trial and error	6	40.0	2	40.0	3	60.0	1	20.0
6) Corporate strategy and shared value	Innovation as strategy/core- value	8	53.3	5	100.0	2	40.0	1	20.0
	Total counts	65		24		20		21	
	% of total counts	100		36.9		30.8		32.3	
Theme 7: Knowledge sources									
1) Sources of innovation	Ideas from people of all ranks	3	20.0	1	20.0	1	20.0	1	20.0
	Adoption of external innovation	3	20.0	1	20.0	2	40.0	0	0.0
	Joint innovation with external parties	5	33.3	4	80.0	1	20.0	0	0.0
2) Sources of knowledge	Lesson learned from mistakes	3	20.0	1	20.0	1	20.0	1	20.0
	New knowledge gained from R&D	5	33.3	3	60.0	2	40.0	0	0.0
	Searching for knowledge from Internet, research papers and exhibitions.	5	33.3	0	0.0	2	40.0	3	60.0
	Learning and sharing session	4	26.7	1	20.0	2	40.0	1	20.0
	Training or taking innovation courses	8	53.3	3	60.0	1	20.0	4	80.0
	Learning from alliances	6	40.0	1	20.0	2	40.0	3	60.0
	External site visit	2	13.3	2	40.0	0	0.0	0	0.0
	Knowledge management system	5	33.3	2	40.0	1	20.0	2	40.0
	Total counts	49		19		15		15	
	% of total counts	100		38.8		30.6		30.6	

Table 4.3 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
Theme 8: Environmental elements									
3) Customer and market-orientation	Customer insight and market intelligence	9	60.0	3	60.0	4	80.0	2	40.0
4) External triggers for innovation	Competition in the market	3	20.0	2	40.0	1	20.0	0	0.0
	Short product life cycle	2	13.3	1	20.0	1	20.0	0	0.0
	Laws and regulations	2	13.3	2	40.0	0	0.0	0	0.0
	Social trends	2	13.3	2	40.0	0	0.0	0	0.0
	Technological changes	9	60.0	2	40.0	2	40.0	5	100.0
	Total counts	27		12		8		7	
	% of total counts	100		44.4		29.6		25.9	

4.3.1.1 Theme 1: Structure

This theme refers to the structural elements that are found in the innovation related functions. The data for analysis were derived from the answers to the interview question, “What is the structure of the innovation function in your organization?” Thirty meaningful expressions were gleaned from the interviews which yielded three categories: 1) flat structure, 2) cross-functional project teams, and 3) internal spatial separation of structure.

1) Flat Structure

Flat structure is the structure in which there are very few hierarchical layers between the operating staff and the management.

Nine companies said they had flat structure for the innovation function. Here are some illustrative quotations from the interviews:

Interviewee 1-SB: “The organizational structure in the R&D facility is rather flat, with BU head at the top and project teams being managed by project leaders. Staff at any level can always access the top man directly if they want to.”

Interviewee 2-DE: “The company got rid of most of the middle management and requires each business unit head to work closely with each project team. And he even has to handle one project by himself.”

2) Cross-Functional Project Teams

A cross-functional project team is a project team comprising members from different functions in the organization.

Regarding this category, 11 companies said they used cross-functional project teams for their innovation projects, citing better collaboration and all-round expertise in the teams. The following interview quotations give representative comments on this issue:

Interviewee 1-SA: “The project team members are composed of Planning Division, Factory, Marketing etc., whose diverse expertise are necessary for the success of innovation projects.”

Interviewee 3-LL: “When we have a project, the project leader will form a project team, choosing team members from various functional departments. Once the project is finished the project team is disbanded.”

Interviewee 2-DE: “New innovative services to clients will be jointly scrutinized and executed with all parties concerned, to ensure the best possible results.”

3) Internal Spatial Separation of Structure

This category refers to the setting up of new separate business unit or department within an existing company, to handle its innovation function.

There were 11 companies saying they had a separated department or business unit handling the innovation in the company:

Interviewee 1-TA: “Innovation Center is responsible for innovation of new products, new processes and new production technology. Whereas R&D in the factory is responsible for improvement in product features, improvement in production processes which falls into the category of improvement of existing products or processes.”

Interviewee 2-SL: “In the past, The Operations ran R&D. After the re-organization, the company set up Business Development as an independent department taking charge of innovation.”

Interviewee 3-IN: “Instead of creating a new startup, we set up a new internal business unit, much like a startup, to handle the business of creating this new product and commercialize it.”

4.3.1.2 Theme 2: System-Process-Tool

System-process-tool refers to the systems, processes, tools and mechanisms employed in the innovation function.

The data for analysis were derived from the answers to the interview question, “How do you manage innovation in your organization?” The answers to the questions generated 17 meaningful expressions which were grouped into five codes. These codes were, in turn, grouped into two categories, namely, 1) mechanisms/tools for idea generation, and 2) mechanisms/means for motivation to innovate.

1) Mechanism/Tool for Idea Generation

This category refers to the mechanism/tool used in creative idea generation. This included specialized methodology/processes for creativity enhancement.

Three companies said they had one or more of these processes in use in their organization especially in the innovation related functions. The following quotations from the interviews give vivid examples of the tools employed in these organizations:

Interviewee 1-CA: “After attending a course on Design Thinking at MIT, USA., we began to utilize this method in our innovation management and have been using it effectively ever since.”

Interviewee 1-CB: “When we first implemented our innovative organization, everyone wondered how we should proceed. We first set up some guideline and then we opted for tools for innovation, such as TRIZ.”

2) Mechanism/Means for Motivation to Innovate

This category refers to the elements that motivate employees to participate in innovation. It can be a process, mechanism, business activities or any management means that ignite the motivation to participate in innovation in organizations. There are three codes generated in this category: (1) innovation contest;

(2) knowledge sharing sessions; (3) commercial success of the new products; and (4) rewards and recognition for innovation.

(1) Innovation Contest

Six companies cited innovation contests as the means for the motivation. Some illustrative quotations from the interviews give a good account for this code:

Interviewee 1-CB: “We use innovation contests as tools to motivate people to participate in innovation. Apart from a corporate level contest, each business unit also implements its own innovation contest to promote innovation efforts within the business unit.”

Interviewee 2-DE: “The company promotes participation organization-wide. We have an annual event in which we urge all departments, even Finance or HR, to form up teams and tackle real issues to come up with solutions for customers. Any entries will get some pocket money up front. And the top 3 best ideas will get financial awards and a trip to a trade exhibition in Tokyo.”

(2) Knowledge Sharing Sessions

Two companies claimed innovation knowledge sharing was an effective activity producing a sense of achievement and motivation to the presenters. Some quotations from the interviews illustrate the concept:

Interviewee 2 SL: “There are not any official innovation or idea awards. But we have knowledge sharing sessions for staff to present their successful project and share insights. They would feel proud to present their knowledge to others.”

Interviewee 3-DI: “Every year we jointly hold an academy camp with one famous university. We share our knowledge with the higher year students. This is good for both the students and ourselves, because we

feel joy in sharing knowledge with those students and it reassures us that what we do has value and meaning. This, in effect, motivates us to try more and harder in our work.”

(3) Commercial Success of the New Products

This category states that innovators get satisfaction from seeing the success of their innovation in the market.

Two companies confirmed product sales and achievement as a motivator for innovation, as follows:

Interviewee 1-SB: “Researchers also want to see the achievement in their work, they are happy to see their work turning into products on the market.”

Interviewee 3-DI: “It is quite motivating for the team to know that the products they innovated have been sold to XYZ companies. They feel good to know that what they innovated are being utilized by someone and generate income for the company.”

(4) Rewards and Recognition for Innovation

This refers to the acknowledgement, recognition and rewards given to employees for their innovation achievements.

Four companies confirmed that rewards and recognition for innovation accomplishment were a source of the motivation. Some quotations from the interviews represent the concept:

Interviewee 1-CB: “At times, financial rewards for innovation efforts are a good tool in spreading the sentiment for innovation. People can speak proudly of how much reward they get for their innovation or improvement projects for the year. This will show that anyone can achieve something from their innovation or improvement ideas and thus encourage their peers to participate. Moreover, we can further enhance

the motivation levels by formal announcements of the top scorers for the year. This will keep the sentiments for innovation high and contribute to the culture building.”

Interviewee 1-SB: “Researchers do not just crave for financial rewards; they want recognition for their achievement as well. Therefore, we must not forget to also give them the credit where it is due.”

4.3.1.3 Theme 3: Staff-Related Elements

This theme refers to the elements relating to staff that are antecedent of innovation in organizations.

The data for analysis were derived from the answers to the interview question, “What are the factors related to the staff that enhance their innovativeness?” The content analysis of the answers yielded 76 meaningful expressions which were grouped into 14 codes. These codes were, in turn, grouped into four categories, namely, 1) knowledge and skills, 2) attitudes for innovation, and 3) learning. Details of this theme are displayed as follows:

1) Knowledge and Skills

This category refers to the knowledge, competency, capability and skills in staff that are antecedents of innovativeness of the organization. It includes 4 codes as follows: (1) functional expertise; (2) ideational fluency; (3) flexibility and adaptability; (4) good teamwork skills.

(1) Functional Expertise

Functional expertise refers to the knowledge and skills of employees in their respective job functions.

Eleven companies cited this element as existing and necessary in their innovation function. Following are some illustrative quotations from the interviews:

Interviewee 1-TA: “We hire a number of R&D staff at the Innovation Center. The staff comprised people with different expertise and

backgrounds. There are a few foreign staff from overseas who possess the expertise that we lack locally.”

Interviewee 2-NN: “In the R&D, we separate the work-force into 2-3 sections to concentrate on their specialties, i.e. Analysis team, Development team and Testing team.”

Interviewee 3-LL: “When we have a new project, the project leader will form a project team, choosing team members from various functional departments for expertise that are necessary in the project. Once the project is finished the project team is disbanded.”

(2) Ideational Fluency

This category refers to the ability to generate creative ideas and think out of the box.

Five companies said this was the quality in innovation staff that contributes to innovation in organizations. Following are some interview quotations in this regard:

Interviewee 1-TA: “Creativity is a characteristic of our innovative people and teams. It works in such a way that when one person introduces an innovative idea, the others would add more and more ideas to it, which would eventually shape up the initial idea into a well-tuned and more concrete practical idea.”

Interviewee 2-NN: “My team members must initiate ideas that have at least 60-70% chance to succeed, not simply dreaming up fanciful ideas that have no chance of turning into reality. The ideas will then get batted around by the team until something really good takes shape.”

Interviewee 3-IN: “What is important in our staff is the ability to mix and match several ideas to derive new innovative products.”

(3) Flexibility and Adaptability

This is the ability to adapt to changes in task environment and to alter courses of action accordingly to achieve targets.

Four companies mentioned this as a factor required for employees' innovativeness. The following quotations illustrate the concept:

Interviewee 1-CB: "There was this product that our team first developed for Japanese market and they later made adaptation to fit the Thailand market and launched it. This adaptation proved successful in our market."

Interviewee 1-TA: "When they go to the factory, they would always ask why and what about the production lines, they are always thinking about ways to change this and that in the process to make it work better, faster."

Interviewee 2-UI: "...And the good R&D people must be open-minded, ready to listen to differing opinions, and are quick at adopting new things or ideas. They must be flexible in changing their course of action when there is an impasse in the extant method."

(4) Good Teamwork skills

This element refers to communication skill, and the ability to build interpersonal relationship with others to sustain the milieu of good teamwork.

There were five companies who cited the importance of this element in their innovation team atmosphere, as in some of the quotations below:

Interviewee 2-SL: "We nurture relation building, because any creative idea will materialize through cooperation of the team. Creative people without good relationship with other team members can seldom get things done."

Interviewee 1-SB: “These R&D staff are not good at communicating and socializing with other people especially those outside of their function. Therefore, we need to develop and embed these skills in them. Taking them to meet customers, for example, is one way to develop the skills.”

Interviewee 3-DI: “When I recruit a new employee, I always look for someone who will fit in the team. He must be able to adapt to the present culture of work in our organization. He must be able to mingle well with other people because teamwork is key to our innovation work here.”

2) Attitudes for Innovation

This category refers to the mental attitudes in employees that are necessary for pursuit of innovation. There are six codes generated for this category with details as follows:

(1) Affection for Creating New Things

This refers to the employee’s affection for innovating new products or work processes.

There were three companies that clearly cited this as the quality found in innovation people, as can be seen from some of the quotations below:

Interviewee 2-PR: “I was not a good student in college, nor was I graduated from any innovation-related field. However, when I started working in this family business, I developed this liking for creating new products, and new equipment for the production lines. And I have been wanting to create more and more new things ever since.”

Interviewee 2-NN: “They are very enthusiastic in their work, always enjoy working on new innovation projects.”

(2) Curiosity and Inquisitiveness

This refers to the employees' curiosity in things around them. It includes inquisitiveness, and eagerness to find out about things that interest them.

There are four companies stating curiosity in their staff were traits that accounted for innovativeness. Some of the quotations expressing this trait are found as follows:

Interviewee 1-TA: "Innovative people are always curious about what and why of things. They always ask, 'Why are we doing it like that? Can we do it in this new way?' etc."

Interviewee 2-NN: "The first trait I see in our team members is the curiosity in things around them, they are not complacent with what exists at present, always want to improve or develop new things or new way of work."

(3) Open-Mindedness

Open-mindedness refers to the quality of being open to other people ideas, accepting and taking in the better ideas to replace their own.

There were three companies stressing the importance of this characteristic. Following are some illustrative quotations from the interviews:

Interviewee 1-SB: "Our corporate values feature "open-mindedness and challenging". Employees must be open-minded, open to new ideas, new ways of doing things."

Interviewee 2-UI: "And the good R&D people must be open-minded, ready to listen to differing opinions, and are quick to adopt new things."

Interviewee 3-DI: “The project team leader is very open-minded. She would listen to any opinions from her team patiently, discuss and evaluate the opinions before accepting or rejecting them accordingly.”

(4) Challenging the Status Quo

This refers to the characteristic that defies status quo and complacency.

There were five companies stating challenging the status quo as an important quality in their innovation staff. Some quotations clearly illustrate this concept:

Interviewee 1-SB: “Innovation people must think out of the box, not clinging to the traditional beliefs. Some ideas may seem like whimsical dreams, but they will know among themselves that those ideas will work or not.”

Interviewee 2-NN: “They do not cling to the status quo or what exists. They incessantly like to work out new things, or to develop new ways of work.”

Interviewee 3-IN: “These staff are willing to take on new challenges, they will take on any new jobs without any excuses not to.”

(5) Achievement Orientation

This refers to the attitude of always striving for success; persistence in achieving targets set out for them.

Five companies specified this as a desired characteristic in their innovation staff. Following are some illustrative quotations from the interviews.

Interviewee 3-LL: “A good worker in my team must be action-oriented, persistent in achieving the target of his job, does not easily give up when

encounter problems but will find ways to work round the problems until solutions are derived.”

Interviewee 1-SB: “Researchers like to see the achievement in their work, they are happy to see their work turning into products on the market.”

Interviewee 2-UI: “The R&D staff must be achievement-oriented...”

(6) Taking Responsibility and Commitment to His Job

This code refers to being responsible and committed to one’s job.

Six companies pointed out that responsibility and commitment in finishing one’s job was highly required in their innovation project teams. This is shown in the following quotations from the interview.

Interviewee 2-NN “The important quality in the person is taking responsibility for his initiative. If he proposes any creative ideas, he must assume responsibility in following through till it materializes.”

Interviewee 3-LL: “What I look for in my team is a person who take responsibility in his job and work hard to get the job done well.”

Interviewee 3-IN: “My team members must be passionate and highly committed to his job, highly responsible in finishing the project as planned.”

3) Learning

This category illustrates three aspects of learning of innovation staff. It includes issues such as (1) affection for learning; (2) self-learning; (3) learning from mistakes.

(1) Affection for Learning

This concept indicates the liking for learning in order to enhance one's knowledge, skills and expertise.

Six companies stated the affection for learning as a requisite in their innovation people. Some quotations from the interviews illustrate this aspect:

Interviewee 1-CB: "Innovation people have a voracious appetite for learning. They like to experiment their ideas. They are action oriented."

Interviewee 1-TA: "This group of people appear to be always in the learning mode. They would search in the internet to follow trends of technology. When they go to the factory, they would always ask why and what about the production lines..."

Interviewee 3-JJ: "These staff are not only capable, but they also love to learn, to search for knowledge. When others may be browsing the web for fun, they would search the web for academic papers to read."

(2) Self-Learning

This code means learning by oneself, from various sources one can lay hands on.

Five companies pointed out self-learning as an element in their innovation team members. Following are some illustrative quotations from the interviews:

Interviewee 2-UI: "Self-learning is one of the imperative learning styles for R&D people. They are very capable in finding new knowledge on their own from various places and media."

Interviewee 2-DE: “He [CEO] is well versed with this new trend of digital media and marketing. He started following the trend many years ago before it became a major thing like in the present. At the time no schools had any courses on digital media and marketing, he learned by himself and it can be said that he has become one of the few foremost experts in the industry.”

Interviewee 3-GG: “We are in the IT industry; therefore, we have to closely follow the development in the industry, we must keep up with the new technology that emerges so as to be able to service our customers well.”

(3) Learning from Mistakes

Learning from mistakes refers to the lesson learned from one’s mistakes on the job or from the innovation project. This is a valuable lesson gained from experience.

There were five companies who attached importance to lessons learned from past mistakes so as not to repeat them again. Following are some of the interesting quotations taken from the interviews:

Interviewee 1-CB: “We keep records of all projects whether they are a success or a failure. We must learn from failures. We must identify why it failed. That’s the learning we gain from failures.”

Interviewee 2-PR: “If anyone comes up with a very good idea, I usually do not bar him from experimenting on it. Instead I will set up a budget for an experiment to prove if it works or not. If the experiment fails, I will blame no one, treating it as a lesson learned.”

Interviewee 3-LL: “We try to get the staff to learn from real work. We arrange for a reflection session when we get the team members to have a week break from the project to give them some time to ponder what

work and do not work in the project up till that point, and to think of what actions to take further in the project. This serves as a lesson learned for them.”

(4) Keeping Pace with the Latest Technology

This code refers to monitoring technology trends and updating one’s knowledge and skills accordingly.

There are nine companies stipulating this as their normal practice, as can be seen from the following interview quotations:

Interviewee 1-SB “In our industry, there are frequent disruptions, so we have to update the competency of our innovative people on a regular basis. We even send them attend training courses in institutes overseas where there are top ranked professors of the field to learn the latest technologies that have emerged.”

Interviewee 2-SL: “We have brought in the newest digital technology to our processes in order to save time in setting up the machines. Less set-up time means lower cost for us to be competitive in the market.”

Interviewee 3-JJ: “From time to time I send my team for study trips in Japan, Hongkong, and the US to get updated on the progress of technology.”

4.3.1.4 Theme 4: Human Resource Development and Management

This theme discusses the issues of learning and development and human resources management that enhance innovation in organizations.

The data for analysis were derived from the answers to the interview question, “How do you develop your staff for innovation?” The content analysis of the answers yielded 15 meaningful expressions which were grouped into six codes. These codes were, in turn, grouped into two categories, namely, 1) learning and development, 2) effective talent recruitment practices.

1) Learning and Development

This category covers the issues of training, education and staff development. There are five codes altogether including (1) coaching; (2) job rotation; (3) technological competency development; (4) development of communication and socialization skills (5) development of creativity skills

(1) Coaching

Coaching refers to one-on-one guiding, advising and teaching for someone to master his job.

There were three companies indicating this practice as the way they groomed their staff. Following are some illustrative quotes from the interviews:

Interviewee 1-SA: “Our staff are monitored closely by their bosses in both their functional department and project team. They will take time to coach the employees by giving feedback on their performance. This is done with close cooperation between the relevant bosses.”

Interviewee 2-NN: “Regarding staff development, we stress on-the-job-coaching. We explain how to do the job; we coach them how to solve the problems arising on the job.”

Interviewee 3-IN “There is a big dedicated server that we store everything. But as for real knowledge transfer, we need to do face to face coaching for every staff.”

(2) Job Rotation

Job rotation refers to periodically rotating employees to work in different jobs.

Two companies indicated job rotation as an employee development means to expose the employee to diverse work experience and to gain various competencies and perspectives. The following quotations illustrate the concept:

Interviewee 1-SB: “In my organization, because we have quite a number of R&D people, so we allocate some to focus on long term innovation, and some to focus on creating new product features to build up immediate sales volume. And we rotate the staff between those two functions to acquaint them with the fact that our business does not just focus on creating immediate sales or focus on only creating new knowledge for the long term.”

Interviewee 3-DI: “We train people to learn new skills by assigning them to try out new role that they are not well-acquainted with. But we do this only when we are not in a rush to finish the project.”

(3) Technological Competency Development

This code refers to the development of technological in innovation staff to enhance their competency for their jobs.

Three companies explained the needs and methods for technological competency development in their staff, as follows:

Interviewee 1-SB: “In our industry, there are frequent disruptions, so we have to update competency of the innovative people on a regular basis. We have them attend training courses in institutes overseas where there are top ranked professors of the field to learn the latest technologies that have emerged. And sometimes we need open innovation to utilize external expertise that we lack.”

Interviewee 2-NN: “There are various technical training for the staff throughout the year to update their knowledge and skills. They might be in-house training by internal experts, or we may invite experts from outside to teach in these in-house sessions. And we also send staff for overseas training with our suppliers in Japan, or Italy etc.”

Interviewee 3-IN: “Our staff get training in new technology from internal experts, and sometimes we hire outside experts to give workshops. Besides, we also send our staff for training in Japan with our business partners.”

(4) Development of Communication and Interpersonal Skills

This category refers to competency development in terms of communication.

There are two companies who addressed the lack of communication skills in their innovation teams, as illustrated in the following quotations from the interviews:

Interviewee SB: “These R&D staff are not good at communicating and socializing with other people especially those outside of their function. Therefore, we need to develop and embed these skills in them. Going out to meet customers is one of the ways to develop the skills.”

Interviewee 3-IN: “One thing I found about innovation people is that many lack communication and presentation skills. They do not seem to clearly and efficiently get across what in their mind to other people. This is the area that I am concerned and plan training sessions for.”

(5) Development of Creativity Skills

This category refers to training on idea generating tools to enhance creative idea generation.

Two companies gave examples of such development activities for their staff, as shown in the following interview quotations:

Interviewee 1-CB: “We have year-round training courses on TRIZ, or other innovation and improvement tools, for example. Kaizen, Six Sigma etc.”

Interviewee 1-TA: “As for people development, we hold creativity workshop to support them to think and to work better. This is coupled with some other tools such as creativity contests to stimulate their creativity on topics of their choice.”

2) Effective Talent Recruitment Practices

This category refers the issue of competency-based recruitment specifically the interview process.

Two companies expressed their emphasis on the effective competency-based interview practice for the right choice of recruits for their innovation function. The illustrative quotations from these companies are as follows:

Interviewee 2-NN: “We execute innovation competency-based recruitment, looking for those innovation competencies during interviews. For example, I will ask detailed questions specifically to probe their observation skills, and to assess their creativity skills”

Interviewee 3-GG: “I spend a couple of hours interviewing a candidate. I spend that long a time because I do not believe that just a couple of interview questions can get you to know how capable an applicants is. I look for real competencies that they possess. I always pose a final question asking them to describe what loss the company will suffer by not hiring them. This proves a powerful question to get them to show concretely what worth they have for the company. Eighty percent of the successful new recruits are capable people that contribute to the teams.”

4.3.1.5 Theme 5: Leadership for Innovation

Leadership refers to a leader’s ability, mental model, attitude, skills, behaviors and actions that motivate, inspire and facilitate individual and collective efforts to achieve shared objectives.

The data for analysis were derived from the answers to the interview question, “What are the leadership factors that enhance innovation in the organization?”

The content analysis of the answers yielded 99 meaningful expressions which were grouped into 22 codes. The codes, in turn, yielded 10 categories as follows: 1) showing support for innovation, 2) emphasis on teamwork, 3) showing passion and/or involvement in innovation, 4) pragmatism, 5) risk-taking, 6) openness, 7) competencies, 8) cognitive ability, 9) transformational leadership, 10) key facilitators for innovation. Details of the theme are displayed in the following.

1) Showing Support for Innovation

This category refers to the leadership's support for innovation in the organization.

Seven companies confirmed the relevancy of this issue in enhancing innovation. Some quotations from the interviews illustrate this concept:

Interviewee 1-TA: "The CEO holds town-hall meeting regularly. Apart from presenting the corporate performance of the period, he would touch on the focus of the corporate strategy on innovation and sustainability. He would mention the support from the company for innovation by the amount of the resources invested in the innovation center, how it would turn out new products, new process technologies; and emphasize the importance of these innovation for the future of the company."

Interviewee 2-UI: "The leaders must show interest and support for innovation. Because R&D is not just another run-of the-mill department, it is one of the most significant functions in our business."

Interviewee 3-IN: "There is one staff who came up to me with an idea of remote monitoring of toilet room vacancy. I let him experiment that idea using the company's facilities. The result turned out OK and I approved the innovative device and software to be installed on the toilet facilities for use in the company. This little concept and technology was later improved and utilized in some of our new products."

2) Emphasis on Teamwork

This category refers to leaders' nurturing trust, collaboration and teamwork.

Six companies indicated the presence of this leadership activity in teams at all levels. Following quotes from the interviews illustrates this:

Interviewee 1-TA: "Leaders must build the up the motivation for cross-functional collaboration because in one innovation project various expertise from different functions are required."

Interviewee 3-LL: "One of the responsibilities for project leaders is to create teamwork atmosphere for all members to collaborate well in order to complete a project efficiently and effectively."

3) Showing Passion and/or Involvement in Innovation

This category refers to leaders' passion, enthusiasm, interest or involvement in innovation. Twelve companies confirmed this trait in their leaders, some vivid examples from the interviews are shown below:

Interview 1-CA: "Our leaders of innovation must have visions as well as passion in his work. Visions are about initiatives, while passion is about materialization of the initiatives."

Interview 1-SA: "Good leaders must be visionary ... They must be passionate in their vision and show the followers the enthusiasm in materializing the vision."

Interviewee 3-DI: "My CEO is an exceptionally passionate person of innovation. Almost on a daily basis, he would talk about some new technology from here and there, giving us the big picture of how we might incorporate the new technology in our future inventions, etc."

4) Pragmatism

This category is about thinking of or dealing with problems in a practical way, rather than by using theory or abstract principles. It involves two codes: (1) action orientation; and (2) having evidence-based judgement.

(1) Action-Orientated

This refers to the preference for action to prove an idea or concept rather than debating about it. Two companies cited or demonstrated this as a quality in an innovation leader, as follows:

Interviewee 2-PR: “If anyone comes up with a very good idea, I [the top management of innovation] usually do not bar him from experimenting on it. Instead I will set up a budget for an experiment to prove if it works or not.”

Interview 2-NN: “Yes, R&D leaders are action-oriented. We [leaders] must take action and experiment on any idea or else we will not get the clear picture of what it really is, and how it will probably turn out.”

(2) Having Evidence-Based Judgement

This code refers to a leader’s decision making which is based on facts and figures, not on his own imagination.

Five companies indicated this trait in their leaders as seen from the following quotations.

Interviewee 1-CA: “Leaders must be on board; they cannot just make decisions from their office. They must go out and see firsthand what going on out there in the field.”

Interviewee 1-SB: “When we want to launch a new product, we would come up quickly with a prototype, and take it to our retailers to sound out their opinion of it, make adjustment according to the information

gathered from them, iterating the process until we get it right, before we decide on the actual production.”

Interviewee 3-IN: “The project leaders are always in touch with the situation of the projects on hand. They make decisions based on the facts and data derived from the frontline of the projects.”

5) Risk-Taking

This category refers to the orientation to take actions or make investments without knowing for sure what the outcome would be. It includes (1) risk-taking; and (2) tolerance for failures.

(1) Risk-Taking

This code refers to the decision to take action without knowing for sure what the result will be. Five companies indicated this trait in their leadership. Some examples of the quotations from the interviews are as follows:

Interviewee 1-SA: “Leaders understand that mistakes can occur all along the way, that we must be able to learn from mistakes, must be able to take risks, to implement ideas into action. And they do not simply judge on short-term results.”

Interviewee 3-LL: “A leader should be comfortable with risk. Because in any innovation projects, one can never know for sure what result will turn out at the end of the projects.”

Interviewee 3-IN: “It was a risk at the time that I decided to invest in the new software project, because we never knew if there would be market for the product. But I decided to invest and went ahead. Fortunately, it turned out all right and we are making profit from the sales of this new solution on Cloud.”

(2) Tolerance for Failures

This code refers to the ability to tolerate failures or mistakes that happen in innovation projects or to not expect perfect result every time. This tolerance is related to the risk orientation level that a person has.

Three companies indicated this trait as essential to the management of innovation in their organizations. Following are two illustrative quotations from the interviews:

Interviewee 1-TA: “Judging from the top management in the company, I would say good leadership for innovation is risk taking, being tolerant to a certain degree of loss, or failures, and not expecting perfect results all the times. Without these traits I dare say innovation in the company would not have succeeded.”

Interviewee 2-NN: “My boss is always OK with experimenting on new product developments, he would give us [R&D] full autonomy in deciding on what new products to innovate. If we fail in any experiment, we just inform him in a meeting, he will not be upset or anything as long as he knows that we have tried our best. After all, he is fully aware that new products are the lifeline of the company’s revenue stream, without experiments no new products will take shape.”

6) Openness

This category refers to welcoming, accepting new ideas or being receptive to any situations that arise in the work environment. It includes 2 codes, namely, (1) being accessible to team members; and (2) open-mindedness.

(1) Being Accessible to Team Members

This element refers to being accessible leaders to their team members, for a discussion or advice.

There were five companies indicating easy access to leaders by their team members. Following are some illustrative quotations displaying this notion.

Interviewee 1-TA: “He [head of Innovation Center] is open and accessible for talks at all times. If you come to him with any questions, he will always hear you out.”

Interviewee 3-IN: “Accessibility to the leader by the team is often necessary in running a project efficiently, especially when the team members need immediate advice, suggestion or decision in regard to issues arising in the on-going projects.”

(2) Open-Mindedness

This code refers to openness of a leader to other people’s idea, especially ideas from his team members, and the willingness to try out and accept new possible ideas.

There were six companies identifying this quality in their leaders as a leadership trait that enhanced innovativeness in teams. Following are some quotations from the interview that directly express or indirectly imply this trait in their innovation leaders.

Interviewee 2-SL: “The boss is very open-minded. He is the type to listen and encourage his team members to express ideas and take actions on the ideas. This leadership trait is rather important in making his team to dare to think, dare to express ideas and to suggest ways to do things or solve problems.”

Interviewee 2-PR: “Often when I [the Director of Innovation] am at my wit’s end as to how to proceed in a project, I would ask for opinions from my product development team members who may not be highly educated, they would surprisingly suggest a brilliant idea that actually works, which I have not thought of.”

Interviewee 3-GG: “Leaders in this [software] organization foster the atmosphere of openness to ideas to motivate people to express their

thoughts or voice their opinions or make suggestions, without fearing harsh outright rejections from their bosses. This is a great motivator for our [software development] project teams.”

7) Competencies

This category refers to the competencies of leaders that positively effect innovativeness and motivation to innovate of the team members. It includes five codes as follows: (1) being visionary and communicating the vision; (2) good networking; (3) adaptability and flexibility; and (4) empowering.

(1) Being Visionary and Communicating the Vision

This code refers to an ability to form a future vision of what the company should and could become and do to prosper and sustain, and the ability to articulate and communicate the vision to others clearly and effectively.

There were seven companies indicating the significance of this leadership competency. Some quotations from the interviews give a clear account of the code as follows:

Interviewee 1-CA: “Leaders for innovation must have visions as well as passion in his work. Vision is about initiatives, while passion is about turning the vision into reality.”

Interviewee 2-DE: “My boss [CEO] is very visionary. He has a clear and right vision of what to become in the coming years, and he has been correct so far. His vision is sort of guiding the direction for our innovation team to focus on.”

(2) Good Networking

This code refers to the ability of leaders in creating business network in the industry and beyond.

There were four companies who identified this as an important competency in their leaders that enhanced the company’s innovative capability. Following are the quotations addressing this element.

Interviewee 1-CA: “After I came back from the innovation management course at MIT, I started a project in coordination with 10 outside organizations. We created an innovation award open to the public. This is truly an open innovation project, which consequently evolves into a massive business network. From this network, we are exposed to various innovations which we have been successfully commercializing for launches in our retailers.”

Interviewee 2-NN: “The boss [CEO] has good network in various industries. He can always turn to this network for assistance in our R&D projects if we need. For example, when we face an impasse in a project, he will introduce us to someone from his network with the relevant expertise to help tackle the problem.”

Interviewee 3-IN: “The founders of the company are Japan alumni and we also have Japanese IT companies as our shareholders and partners. In recent years we have also established business connection with some western companies. All these partners form a global network that exposes us to the technological developments worldwide”

(3) Adaptability and Flexibility

This code refers the ability to adapt to changes in task environment and to alter courses of action accordingly to achieve targets. Six companies mentioned this as a factor required for organizational innovativeness, and hence innovation. The following quotations illustrate the concept:

Interviewee 1-CA: “In establishing a new business in other country, we must adapt to the local context. We cannot execute the business there totally based on the business model for our country; some changes need to be made accordingly.”

Interviewee 2-UI: “R&D themselves know full well how long a project will take. Therefore, we can agree up-front on the reasonable timeline. But I am always flexible and ready to change the timeline if the true situation demands so.”

Interviewee 1-LL: “There are five or six principles in managing a project. But it boils down to one thing, that is, “to learn and adapt” along the way in an iterative manner so as to achieve the best possible result.”

(4) Empowering

This code refers to delegating authority to followers to make decision on their own.

Six companies emphasized empowering their innovation project teams to work and make decisions freely on their own as long as they contributed to the achievement required of them. The following interview quotations give a clear picture of how they execute the empowerment.

Interviewee 1-SB: “The R&D people here are senior staff; they can make many decisions by themselves without resorting to superiors. It does not just speed up work process but also serve as leadership development.”

Interviewee 2-SL: “I [the division head] do not go deep into the day to day operations of project teams, only oversee the big picture. I give full authority for [product development] project owners to act freely as long as they have the targets of their teams in mind.”

Interviewee 3-JJ: “In the process of Agile methodology, every morning the product development team holds a brief meeting. Every team member updates the others on the progress of his part, the problems encountered and solved on the previous day, so the whole team are in sync of the real-time situation of the project. New targets of the day are

arranged and committed by each team member. With this process in use, the project leader can fully empower followers to improvise in how to do their jobs on their own.”

8) Cognitive Ability

This category refers to the knowledge, skills and ability of the leaders for innovation. It includes (1) having broad perspectives; and (2) awareness of the latest business trends.

(1) Having Broad Perspectives

This code refers to the ability of a leader to have a high-level view which result in broad views of the business or projects on hand.

Three companies indicated this as a quality found in their innovation leaders as in the following quotations:

Interviewee 1-CB: “R&D people normally have in-depth expertise in their disciplines, often lacking the big picture perspectives, while management have a bird’s eye view of various fields of knowledge, which is complementary to the expertise of team members....”

Interviewee 1-SB: “...leaders do not necessarily have more in-depth knowledge than the followers because the field develops so quickly that they may not be able to keep up with the details. But it is required that they have a broad perspective, the sort that enables them to see the linkages between all elements of an innovation project and know the interaction between them.”

(2) Awareness of the Latest Business Trends

This is a quality of a leader in being dialed in to the latest business or technological trends.

Three companies stipulated this quality as required in their leaders, as shown in the following quotations.

Interviewee 2-DE: “Our innovation strategy relies heavily on the digital media technology. As you know this is a fast-paced industry, it is thus imperative for the business leaders to keep abreast with the development of the digital media market. They must be well informed in the trends of the industry and the business world.”

Interviewee 3-IN: “Some technologist who do not closely heed the development of the outside world may miss the opportunities to create new innovation combining what they already know and what’s new from out there.”

9) Transformational Leadership

This refers to the leadership that is effective in transforming organizations through changes.

There are four codes comprising transformational leadership, such as (1) inspirational stimulation, being visionary; (2) challenging followers intellectually, (3) individualized consideration for followers; and (4) influencing and persuasion.

(1) Inspirational Stimulation, Being Visionary

This is the trait of transformational leadership that refers to the leader being visionary and able to convey the vision to his team members to inspire them to strive towards the vision.

Six companies showed that this was a trait found in their innovation leaders, as in the following quotations:

Interviewee 3-GG: “This [innovation] leader must be able to look into the future and form a vision of what the future should be, what directions we should proceed. To be able to form a sensible vision, a leader must be dialed in to various sources of information internally and externally.”

Interviewee 3-IN: “From my perspective of working with leaders, I found that being visionary is the most important quality in the

innovation. Leaders must be able to shape the future and articulate what the future looks like to his teams to inspire them to march together toward the vision.”

Interviewee 1-TA: “Leaders must be visionary. Vision and innovation go hand in hand. ...”

(2) Challenging Followers Intellectually

This code refers to the ability of leaders to stretch his followers intellectually, to challenge them to reach new height of their intellectual ability.

There was one company who clearly cited his normal practice in this regard as in the following:

Interviewee 3-JJ: “I would motivate them cognitively by giving them new challenges to whet their enthusiasm, their learning and experimenting. They would form a working group to work on such challenging idea. This will give them another perspective to look at the work we do....”

(3) Individualized Consideration for Followers

This code is about leaders paying attention to their team members as individuals and customize his approach to each of them accordingly for the best performance from each one.

One company clearly indicated this as a trait found in their innovation leaders. The following quotation give clear picture of this trait:

Interviewee 2-NN: “Yes, we know each of our team members well. We know the capability of each of them, knowing who is capable of doing what. And we assign project to each according to their levels of capability.”

(4) Influencing and Persuasion

This code refers to the quality of a leader in getting a follower to do something not by giving orders but by influencing with reasons and logics, facts and figures, etc.

One company gave a good account for this innovation leadership quality:

Interviewee 2-NN: “As a middleman in between the top management and the working staff, when corporate directions are cascaded down to us, we must be able to influence and stir their interest in the project to get them to buy in and commit to the jobs....”

10) Key Facilitators for Innovation

This category refers to some key roles in facilitating innovation efforts which includes: (1) innovation champion, (2) boundary spanning function, and (3) gatekeeper function. These roles are not necessarily those of a leader but can be executed by anyone who are have the potential to influence others.

(1) Innovation Champion

An innovation champion is a person who fully supports an idea, project, or product, and puts efforts to force the idea through any resistance and will evangelize it throughout the organization. This person is also referred to as an idea champion.

There were four companies specifying these roles in their organizations, as seen from these illustrative quotations:

Interviewee 1-CB: “Though we encourage innovation at all levels, we are selective in grooming innovation champions. We have each BU select high-potential people whom we will groom by putting them through various training and development such as TRIZ training which is held every eight months. They have homework, examination and a real project to finish within six months. We select only talents to go through this ordeal.”

Interviewee DE: “Since it totally changes the way business is done, the new innovative business and work process cannot be entrusted to the original employees. So, the company formed a new innovation department and recruited new head to lead the unit as an innovation champion and implementor. And they recruit new staff with the expertise on new digital platforms.”

Interviewee 2-SL: “My staff take care of their routine jobs and at the same time they are also involved in development project, acting as a champion supporting the new project.”

(2) Boundary Spanning Function

This code refers to the task of getting in touch and communicating with external players.

There were two companies specifying these roles in their organizations. The following quotations illustrate the idea.

Interviewee 1-CB: “Some innovations are adopted across from other business units. They normally do not know what the other units are doing. It’s the innovation management role to facilitate the flow of information, the coordination and the adoption between units.”

Interviewee 2-SL: “Project owners will act as a coordinator and communicating with all concerned parties.”

(3) Gatekeeper Function

A gatekeeper is a retriever and disseminator of technological knowledge and information for an innovation team.

Two companies indicated this as a significant role in their organizations, as in the following quotations:

Interviewee 1-SB: “Tech Management function monitor technological trends that are up and coming and may turn into megatrend, and they feed the knowledge into the innovation team.”

Interviewee 2-DE: “Here we have a ‘learning champ’ to update information about customers and also update information of the development in digital media which will keep the team abreast of the trends of the market and the progress on the customers and the customer accounts.”

4.3.1.6 Theme 6: Climate and Culture for Innovation

Climate refers to the shared perceptions among workforce members regarding organizational policies, practices, and procedures as well as the behaviors that are rewarded, supported, and expected at work, whereas Culture refers to shared values, norms, or underlying beliefs of the customary ways things are done in organizations.

The data for analysis were derived from the answers to the interview question, “What are the climate and culture factors that enhance innovation in your organization?” The content analysis of the answers yielded 65 meaningful expressions which were grouped into 13 codes. The codes, in turn, yielded eight categories as follows: 1) psychological safety, 2) diversity, 3) organizational support, 4) collaborative atmosphere, 5) experiment orientation, and 6) corporate strategy and shared value.

1) Psychological Safety

This refers to atmosphere that enhances a freedom to express ideas, and debates.

Six companies stated they have such atmosphere in their organizations, following is one sample quotation that clearly describes the concept:

Interviewee 1-TA: “Here we have an open atmosphere, staff are debating all the times. One can voice his ideas and other would debate freely if they differ.”

2) Diversity

This refers to the inclusion of personnel with varying functions in project teams.

There were three companies indicating this climate in their organizations.

Interviewee 1-TA: “The innovation center comprises staff with various background and expertise and various nationalities as well. They complement each other nicely in the innovation teams.”

Interviewee 2-NN: “Most important thing is our human capital. Our [R&D] team members are from different disciplines, different work background, this fills the gaps that might otherwise emerge.”

3) Organizational Support

This category refers to the support for innovation demonstrated by the management and company leaders; the leaders can show support in the forms of resources or opportunities. There were 13 companies indicating this climate in their organizations. The following quotations describe the support.

Interviewee 1-SA: “One of the important factor is the organizational support in terms of opportunities, budget, etc. that promote innovation in the organizations.”

Interviewee 1-CB: “In order to go on with any innovation initiatives, even if people in value-chain operations all agree on the initiatives, we still need support and consent from the top. Without this consent, the projects cannot take place.”

Interviewee 2-DE: “When there is a good innovation idea coming up, the management will give financial support for it , even though the clients are not paying for it.”

Interviewee 3-GG “We support equipment and facilities for any new ideas that our people want to experiment.”

4) Collaborative Atmosphere

This category refers to the organizational climate that enhances collaboration in innovative organizations.

Nine categories are classified in this category: (1) breaking down silos (2) good co-ordination between functions, (3) frequent meetings, (4) organization-wide participation, (5) showing trust in followers, (6) helping out other members, (7) friendly atmosphere, relaxed atmosphere, (8) open space and modern looking work surrounding.

(1) Breaking down Silos

This code refers to minimizing obstacles that hamper collaboration among related departments.

Three companies describing their efforts in reducing silo effects in their organizations, as follows:

Interviewee 1-CB: “When we first embarked on the new journey towards being an innovative organization, we started off, first and foremost by tearing down the silos built up in disparate departments over the years. It took time and efforts to get rid of the walls.”

Interviewee 2-DE: “Now we call in every party concerned to participate from the beginning of the project, so as to get everyone on the same page from beginning to end. This creates alignment both physically and mentally.”

Interviewee 3-JJ: “We enhance collaboration by having as few functional departments as possible. This reduces silo effects and increase collaboration among departments.”

(2) Good Co-Ordination between Functions

This code refers to the cooperation in achieving a task among parties concerned.

There were seven companies giving evidence of the climate in their organizations, as in some of the following interview quotations.

Interviewee 1-CB: “Sometimes we pull marketing in to help scale up the project. Because the innovation may be launched successfully in his own territory, but to launch it in wider area we need more in-depth marketing expertise.”

Interviewee 2-SL: “When someone comes up with some idea for innovation, we will brainstorm on the idea among different functions e.g. Production, Sales etc., to see how it will work out. In the final stage, we include Accounting/Finance to formulate a costing model to present to the management.”

Interviewee 2-DE: “The big problem to solve was the flow of information. We solved that by having as many project members as possible to visit customers together, in order to be on the same page about the on-going situation. However, it is impossible to have all members to visit customers together at all times, so we installed interactive digital platform to update the information among the whole team so all can always access the information.”

Interviewee 3-GG: “Collaboration is a very important issue. I try to have our people build good relationship with people in other departments, to share information, knowledge and to get help in solving problems.”

(3) Frequent Meetings

This code refers to the meetings of all forms that are frequently held by project teams to update on the progress and situation.

There were two companies describing this climate in their organizations as in the following:

Interviewee 1-SB: “There are frequent small group meetings of the project teams. They discuss the progress, the problems encountered and the probable solutions. They meet several times a month, or sometimes more than once a week. They even meet immediately after getting the results of experiments.”

Interviewee 3-DI: “Our partner in Japan recommended we follow their routine of daily short meeting of project teams. We followed the recommendation and it did us good. This way we get to know what is happening on a daily basis and so can adjust ourselves accordingly and timely. And we can also share insight promptly if there are any important issues cropping up.”

(4) Organization-Wide Participation

This refers to the practice of encouraging participation in innovation from all levels in organization, not limiting innovation to only the innovation function.

Three companies pointing to this culture in their organizations. Some illustrations are in the following quotations.

Interviewee 1-CB: “What we need is a culture that speaks to innovation in terms of continuous improvement. This is why we pull everyone in to participate. If we don’t have the culture, people will all make excuses that innovation is the engineers’ job or the R&D people’s, not theirs. and they will just sit back and not participate in innovation.”

Interviewee 3-GG: “R&D department is the one to create new things. But other non-R&D can also contribute to innovation, at least they can come up with new process of work or they can add in ideas that can contribute the product innovation.”

Interviewee 3-LL: “We motivate people across organization, not only people directly concerned with innovation projects, to contribute to new innovation. Because after all the people from outside the innovation circle are users of our product as well, so they can see things or details that project team may not see.”

(5) Showing Trust in Followers

This refers to leaders’ trusting the ability of his team members and empowering them to carry out their assignments.

Four companies produced evidence of this climate in their organizations, as stated in some of the following interview quotations.

Interviewee 1-TA: “The [innovation center] leader empowers his teams. When he assigns any project, he will specify the expected end result, but will trust his team to figure out how to get there by themselves.”

Interviewee 3-DI: “Leaders must have trust in his followers and give them freedom in doing their jobs.”

(6) Helping out Other Members

This code shows the climate in which team members help each other in their tasks when so required. Three companies stated they had this work climate among team members. The following quotations illustrate this concept:

Interviewee 2-NN: “I have to reshuffle staff to work on the primary tasks for which they have the expertise and after they finish the tasks then I will shift them to help his colleagues do the jobs that anyone can do.”

Interviewee 3-GG: “When any smart staff finishes his work, he must turn to help others in the team to get the project moving faster.”

Interviewee 3-IN: “A good team member is a team-player, he would always help and cover for others when possible.”

(7) Friendly Atmosphere

This refers to the workplace atmosphere that is friendly and not stuffy

There were four companies indicating this climate in their organizations, as depicted in some of the quotations below.

Interviewee 1-SB: “The climate of work here is very informal; we treasure being brotherly colleagues across all levels.”

Interviewee 2-NN: “I keep the atmosphere in our workplace as informal and friendly as possible. We work and live in a brotherly manner, having fun, making jokes and being playful to lessen the stress normally associate with R&D work.”

Interviewee 3-GG: “Our work atmosphere is very relaxing in terms of the workspace and the staff relationship.”

(8) Open Space and Modern Looking Work Surrounding

This refers to the physical workplace that is an open space where everyone on the same project sits together and more often than not it is designed in a modern looking style. Three companies exhibited this open workspace in their organizations. They described the workspace as follows:

Interviewee 1-TA: “At the innovation center, it is an open space, roomy, modernized design. This work environment positively effects innovativeness of the staff.”

Interviewee 2-DE: “Now we are arranging open space to house every function in the same project to work together physically. This will create the effect of collaboration and information flow to keep everyone aligned.”

5) Experiment Orientation

This refers to the preference for experiments over mere discussion in order to prove a creative idea. This includes experiment orientation, and trial and error culture.

Six companies showed this orientation in their work climate and culture. The following quotations indicate the orientation.

Interviewee 1-CB: “We believe innovation is not just about knowledge or expertise but is about putting what you know into action and you’ll learn more along the path of your action.”

Interviewee 1-SB: “Learn-fast-and-fail-fast is how they think and work in innovation. When they think up some innovative idea, they will experiment on it right away. If it fails, then they will learn from it fast and try some other way until they find the good solutions.”

Interviewee 2-SL: “To prove an idea, we will put it to test or experiment on it to find the answer.”

Interviewee 2-UI: “They [R&D] will always do experiments on an idea, buying raw materials to try out the concepts and keep on doing it like that until the good result is achieved.”

6) Corporate Strategy and Shared Value

This indicates a corporate strategy and corporate values focusing on innovation.

Eight companies indicated this element in their organizations, as described in some quotations as follows:

Interviewee 1-TA: “Innovation is one of the 5 or 6 corporate values of the company, on top of collaboration, respect etc.”

Interviewee 2-UI: “In the early days, the innovation management was not in place. There were conflicts and non-alignment, and we could not get innovation out as fast and smoothly as it should have been. Eventually we started calling all parties concerned to sit at the same table, to acknowledge and commit to the same policy and strategies. We make all understand that it is the common goal of all to help materializing speedy launch of every new product in every possible way.”

Interviewee 3-LL: “One of the objectives and strategies of our company is to offer new and better products, service or process for our clients.”

4.3.1.7 Theme 7: Knowledge

This theme refers to the knowledge in the organizations, which is deemed important in organizational innovation. The data for analysis were derived from the answers to the interview question, “From where does your organization get ideas for innovation and/or the innovations?” Upon the content analysis, forty-nine meaningful expressions were collected from the interviews, which yielded 11 codes and, in turn, yielded two categories, namely, 1) sources of innovation, and 2) sources of knowledge.

1) Sources of Innovation

This category refers to the sources of innovation or innovation ideas that lead to the innovation of the organization. They can be from anywhere and in any forms. There are three codes generated in this category: (1) ideas from people of all ranks, and (2) adoption of external innovation, and (3) joint innovation with external parties.

(1) Idea from People of All Ranks

This refers to the belief that everyone in organizations can contribute to organizational innovation, not limited to innovation people such as R&D, New Product Development, Engineering or the likes. Employees at all levels in the organizations possess seeds for innovation right from where they are.

Three companies stated they got their innovation ideas from people of all ranks. The following quotations give some ideas on this concept.

Interviewee 1-CB: “We get innovation ideas from all levels of personnel. People at lower level of operations are involved in daily operation therefore their innovation projects are likely to be about improvement in operation processes. Management have a bird’s eye view vision and so they are able to think up innovation ideas that have are more radical in nature.”

Interviewee 3-IN: “Both leaders and rank-and-file serve as sources of innovative ideas. Anyhow it is worth mentioning that new radical innovation ideas are almost always initiated from the top down. This is because we [innovation leaders] are at a higher altitude looking out with a wider perspective, and we have diverse knowledge base that enables us to mix and match various technologies to form a new product concept. And almost always, the staff in the frontline are the ones to initiate incremental innovation ideas, whether process improvement or product features improvement. This is because they are constantly encountering day to day operations and interfacing with customers, thus having more information in those regards.”

(2) Adoption of External Innovation

This code refers to the innovation adopted from outside the organizations.

Three companies disclosed they adopted innovation from external sources, local or overseas. The innovation could be new technology, new work process or new product or the components. Some quotations below elaborate the notion.

Interviewee 1-CB: “We sometimes adopt new practices from outside the company, but we do not duplicate exactly the whole practices. It’s only 60-70% that we utilize, and the rest we have to adjust to suit our organization.”

Interviewee 2-SL: “In our industry, western countries are leaders in the technology and know-how, they are more advanced in many aspects. We need not do the radical innovation by ourselves, but we need to keep an eye on the latest development and adapt ourselves accordingly and take in the new innovation as soon as possible.”

Interviewee 2-NN: “The original know-how is from our Japanese business partner. But it turned out we cannot apply it wholly to Thai raw materials, so we kept adapting the process until we got it right at a reasonable cost level.”

(3) Joint Innovation with External Parties

Innovation can be jointly developed with external parties, especially the academic institute.

Five companies mentioned they had joint innovation projects with external parties, as described in the following quotations:

Interviewee 1-SA: “There are several sources for innovation. One of them is the access to new technology. We cooperate with academic institutions by sponsoring and cooperating with professors to do

research. We choose the technologies that can be used in our new innovation.”

Interviewee 1-TA: “Here at this innovation center [at a university campus], we work jointly with the university staff and utilized some of their expensive research facilities.”

2) Sources of Knowledge

This category refers to the sources of knowledge that is an important factor for innovation ideas. There are eight codes generated in this category such as (1) lesson learned from mistakes; (2) new knowledge gained from R&D; (3) searching for knowledge from Internet, media, research papers; (4) learning and sharing session, (5) training or taking innovation courses; (6) learning from alliances; (7) external site visit; and (8) knowledge management system.

(1) Lesson Learned from Mistakes

This refers to knowledge gained from learning from reflection on past mistakes to derive insights and knowledge.

Three companies described this as a source of their valuable knowledge for innovation. Some interview quotations lay out details of the concept:

Interviewee 1-CB “We keep records of all projects whether they are successful or not. We learn from failures. We must identify why it failed. That’s the learning we gain from failures.”

Interviewee 2-UI: “We have been doing R&D on our own for many years. But in the early years, more than half of our attempts failed. Anyhow those served as lessons learned for us and added to the body of knowledge. With the knowledge and know-how accumulating over the years, now our achievement rate is very high, thanks to all the lessons learned.”

(2) New Knowledge Gained from R&D

This refers to knowledge and learning created from companies' own R&D function.

Five companies cited this as one of their sources of knowledge for innovation. Some accounts are given in the following quotations.

Interviewee 1-SB: “[Apart from adoption of outside innovation] Another source of ideas is from research within the organizations. We hire a lot of PhDs to do research internally.”

Interviewee 2-NN: “Much of the body of knowledge accumulated in our company today has been gained from our own explorative experiment and research in R&D.”

(3) Searching for Knowledge from the Internet, Media, and Research Papers

This refers to the sources of knowledge which are available publicly for convenient search on the internet or libraries.

Five companies said these were sources of their routine search that offer valuable information. The quotations below give some details of the concept.

Interviewee 2-SL: “We glean market intelligence from external sources, seminars, and research articles. These give us insights into the market trend.”

Interviewee 2-PR “Our innovation ideas come mainly from trade exhibition in our industry. There are a few good international exhibitions overseas that we go to annually.”

Interviewee 3-GG: "... Nowadays apart from KM system in the organization, the Internet is also a source of convenient knowledge for us."

Interviewee 3-LL: "The Internet is a supplementary source of knowledge where we search for information that we want, especially from a website called Reddit."

(4) Learning and Sharing Session

This refers to another source of knowledge from knowledge sharing sessions. Four companies cited this as one of the sources to disseminate knowledge among employees. Following are some quotations mentioning the practice:

Interviewee 1-TA: "We hold learning and sharing sessions for the production people. We show video clips of new production technologies and brainstorm during the sessions on how we could use them in our own process. We try to have them see various changes in the industry to prepare for changes in our own company when the time comes"

Interviewee 3-IN: "As I mentioned earlier about a small invention by a staff for use in remote monitoring of toilet vacancy in the office. After successful completion of the invention, I asked the staff to give a presentation of what and how he did on that little innovation to share the knowledge to other staff."

(5) Training or Taking Innovation Courses

This refers to the traditional way of learning by training and taking courses in innovation.

Eight companies stressed this as one of the knowledge sources for their employees. The quotations below cite this source of knowledge.

Interviewee 1-CA: “One way for us to gain innovation management knowledge is to take innovation management courses”

Interviewee 2-NN: “There are various technical training for the staff throughout the year to update their knowledge and skills.”

Interviewee 3-IN: “Our staff receive training in new technology from internal experts and sometimes we hire outside experts to give workshops. And from time to time we send our staff for training in Japan with our partners.”

(6) Learning from Alliances

This points to the source of knowledge from business alliances. Six companies cited this as one of their sources of knowledge. Some quotations below give a glimpse into the practice.

Interviewee 1-SA: “Nowadays it’s more of an open cooperation of knowledge transfer. For example, we are now cooperating with one of our partners. They are in the same industry and are very advanced in idea generation method for innovation. We asked them to be our advisor, to transfer the knowledge to our people. We are learning from them how they generate innovation ideas effectively.”

Interviewee 2-NN: “Lately we have many open innovation projects with outside parties such as with suppliers or with academic institutes where we often learn something. ”

Interviewee 2-DE: “It is fortunate for us that we can adopt innovation ideas from Japan for use in Thailand. because they have about 10 years' experience ahead of us in this field. A year ago, we requested an experienced Japanese head from our head office in Japan to head the media innovation team and it works out very satisfactorily.”

(7) External Site Visit

This refers to the visit to external sites to gain insight into their operations which might benefit the visitors.

Two companies indicated this as a source for their knowledge as in the following quotations:

Interviewee 1-CA: “Discovery of ideas can come from various sources, for example ... overseas exhibition and site visit; ... These are valuable sources of ideas.”

Interviewee 1-TA: “There are from time to time visits to other companies to see how they work. We recently visited one company to see how they arrange their office for the Agile teams and how they utilize technology in their work to enhance capabilities.”

(8) Knowledge Management System

This refers to the knowledge database system available for search by internal staff.

Five companies signified the significance of this knowledge source for innovation. Some quotations below give more details regarding this knowledge source:

Interviewee 1-CB: “Normally, innovation people do not like documentation. But if their projects are selected as entries of the innovation contest, they will have to enter full details of their project into the system, which they don’t mind because it comes with the honor of being chosen as finalists for the contest. These details actually contribute to the knowledge management system available for searches by all relevant personnel in the organization.”

Interviewee 1-SB: “We have an advanced KM system with dedicated server. Only researchers have access to the knowledge database.”

Interviewee 2-UI: “The intrinsic knowledge may be lost with each personnel if they leave. But we try to keep records of every experiment and that knowledge is retained well within the company readily available for future reference when needed.”

Interviewee 3-JJ: “We have the KM system that when you save what you have done on the server, the system will automatically inform others that you have saved files on such an such issues and it will automatically update the Kanban to let everyone know. This saves time and takes the hassles out of their work.”

4.3.1.8 Theme 8: Environmental Elements

This theme refers to the elements in the work environment that serve as antecedents of organizational innovativeness. The data for analysis were derived from the answers to the interview question, “What are the elements that have an effect on innovation in your organization?” Twenty-seven meaningful expressions were derived that speak to elements in the environment. These yielded 6 codes that, in turn, resulted in two categories which are 1) customer orientation, and 2) external triggers for innovation.

1) Customer Orientation

This category indicates an organization’s focus on customers to gain the customer insight for developing the right innovation for the customers.

Nine companies stressed this factor as an external element that shed light on the directions for their new innovative products. The following quotations give a good account for this element:

Interviewee 1-SA: “It pays to work closely with [B2B] customers. They may have limitation in terms of R&D, lack the necessary knowledge or the technological capacity. Working closely with them helps create close relation with them and, at the same time, helps understand their needs.”

Interviewee 2-SL: “It’s our job to follow the market trend, to try to get the clear picture of how the market will develop in the future, what direction it is heading, what type of product will grow and how we can utilize our capabilities to address the market trend.”

Interviewee 2-NN: “Customer preferences, needs and insights give us the directions for how we should go about in our new product development.”

Interviewee 2-DE: “In this digital era, the competitiveness lies in the research from big data of the consumer behavior so as to come up with the innovation that captures the attention of the market.”

2) External Triggers for Innovation

This category indicates environmental factors that affect the decision to launch a new product development in organizations. It includes five elements as follows: (1) competition in the market, (2) short product life cycle, (3) laws and regulations, (4) social trends, and (5) technological changes.

(1) Competition in the Market

This refers to the competition posed by other companies in the market.

Three companies indicated this element as a trigger for them to launch new products to be competitive in the market. The quotations below cite the importance of this element on organizational innovation:

Interviewee 1-CB: “If there is no competition in the market, we would not develop new products. Competition is, therefore, an important force for us to keep on launching new products.”

Interviewee 2-NN: “New product innovations will create good sales volume because customers are always on the look-out for a new way to

solve their problems. We must be innovative to launch new products to be the first to reach the customers”

(2) Short Product Life Cycle

This indicates the shorter product life cycle than in the past, which keeps companies innovating for new products to replace old ones.

Two companies cited this element in their interviews as follows:

Interviewee 1-CB: “In the past when there were few manufacturers, whatever you produced people had to buy because they did not have much choice. But now there are many manufacturers making the same category of products, the consumers can choose who to buy from. Thus, manufacturers have to compete to produce better products at a faster speed than others. That competition shortens product life cycles and we have to keep launching new products faster and better, that keeps us on our toes, and we have to keep on innovating to be competitive in the market.”

Interviewee 2-SL: “In the past, our product life cycle was 2-3 years, but now it speeds up to mere 6 months. This shorter product life cycle forces us to be speedier in our innovation process. We changed to digital technology; we improved our process speed so as to be able to cope with the quick changes in demand from the market.”

(3) Laws and Regulations

This refers to the effect of laws and regulations on the attempts to come up with new innovation that speaks to the laws and regulations governing the industry. Two companies indicated this element as a trigger for launching innovation answering to the laws and regulations, as in the following quotations:

Interviewee 1-CB: “Sustainability development is an important agenda in the business world today. Environmental sustainability is good, and

making profits is also important in keeping our company alive. Therefore, we need to innovate in such a way that contribute to both aspects. This has become an imperative that it is emphasized in our corporate values.”

Interviewee 1-SA: “To cope with the recent development in laws and regulations regarding environmental and sustainable development, our company have committed ourselves to developing alternate energy. Recently we have come up with an interesting innovation. It is a new solar cells system to produce electricity in totally different environment from the conventional method.”

(4) Social Trends

This element refers to the social trends that beget new preferences for products. This serves as a trigger for vigilant companies to produce new products to cope with social changes.

Two companies signified this element in their business of innovation, as in the following quotations:

Interviewee 1-SB: “Ageing society is the trend of today. We are working on new components of our products that address elder care, the sort of product that focuses on everyday elderly safety.”

Interviewee 2-UI “Following the trend of health consciousness in people young and old today, we have started a new line of business producing food supplements. We have developed quite a number of new products for this market segment which in a sense differs from our present business model. We are enjoying quite a good sale, though”

(5) Technological Changes

This refers to the rapid changes in technology that affect the directions of innovation efforts in organizations.

Nine companies designated this element as an important trigger for their innovation efforts. This is illustrated in the following interview quotations from some of the companies.

Interviewee 1-CB: “We must accept changes. Changes come with opportunities. Changes in technology bring changes to human lifestyle and the way people consume products or service. These changes somehow affect the way we develop our new products to suit the new lifestyle.”

Interviewee 1-SB: “New innovation ideas can arise from the emerging technology or what we called tech-push innovation or may arise from customer unfulfilled needs or as we called it market-pull innovation.”

Interviewee 2-DE: “Now we have almost completely changed our products and services offerings to our clients than what we did just a couple of years ago. This is a right move in incorporating digital media technology into our service offerings. If we did not embrace the change in technology, we could be definitely in trouble a few years down the road.”

4.3.2 Research Question 2: “What are the Paradoxes Encountered and Overcome in Achieving both Innovativeness and Efficiency (Ambidexterity)?”

This research question was to explore the paradoxes an organization faces in the course of managing to achieve both innovativeness and efficiency.

The answers to the interview questions revealed 44 meaningful expressions covering six themes of paradoxes including 1) paradox of cross-functional collaboration vs. one’s own performance; 2) paradox of explorative vs. exploitative activities; 3) paradox of individual vs. team-based creativity; 4) paradox of change vs. continuity; 5) paradox of resource insufficiency; and 6) paradox of learning.

Table 4.4 displays all the paradoxes and their solutions of all the company groups, as well as the frequency counts of the meaningful expressions for each code.

Table 4.4 Paradoxes and the Solutions

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3			
		Total	%	Total	%	Total	%	Total	%		
Theme 1: Paradox of cross-functional collaboration and one's own performance											
1)	Paradox caused by lack of collaboration	Paradox caused by lack of cooperation from other functions		2	13.3	2	40.0	0	0.0	0	0.0
2)	Solutions to lack of collaboration	Setting KPI for collaboration		1	6.7	1	20.0	0	0.0	0	0.0
		Integrated and cohesive cross-functional leadership teams		1	6.7	1	20.0	0	0.0	0	0.0
		Alignment of relevant functions		3	20.0	1	20.0	2	40.0	0	0.0
		Management calling for collaboration		1	6.7	1	20.0	0	0.0	0	0.0
		Enhancing communication and socialization		1	6.7	1	20.0	0	0.0	0	0.0
		Total counts		9		7		2		0	
		% of total counts		100		77.8		22.2		0	

Table 4.4 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3		
		Total	%	Total	%	Total	%	Total	%	
Theme 2: Paradox of explorative and exploitative demands										
1)	Paradox caused by cost control	Paradox caused by cost control in innovation projects	1	6.7	1	20.0	0	0.0	0	0.0
2)	Paradox caused by demands for speed	Paradox caused by demands for speedy completion of innovation projects	3	20	1	20.0	1	20.0	1	20.0
3)	Solutions to cost control in innovation projects	Assigning cost-conscious persons to manage cost control	1	6.7	1	20.0	0	0.0	0	0.0
4)	Solutions to demands for speed	Investment for abundant facilities	2	13.3	0	0.0	1	20.0	1	20.0
		Simplification of processes	1	6.7	1	20.0	0	0.0	0	0.0
		Total counts	8		4		2		2	
		% of total counts	100		50		25		25	

Table 4.4 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3		
		Total	%	Total	%	Total	%	Total	%	
Theme 3: Paradox of individual vs. team creativity										
1)	Paradox caused by lack of interpersonal skills	Paradox caused by lack of interpersonal skills	2	13.3	1	20.0	1	20.0	0	0.0
2)	Solutions to balancing individual vs. team focus	Team brainstorming on individual's initiative ideas	2	13.3	0	0.0	1	20.0	1	20.0
		Team efforts in idea implementation	3	20	0	0.0	3	60.0	0	0.0
		Total counts	7		1		5		1	
		% of total counts	100		14.3		71.4		14.3	
Theme 4: Paradox of change and continuity										
1)	Paradox caused by resistance to change	Paradox caused by resistance to change	3	20	1	20.0	2	40.0	0	0.0
2)	Solutions to resistance to change	Getting everyone exposed to innovation	3	20	1	20.0	2	40.0	0	0.0
		Total counts	6		2		4		0	
		% of total counts	100		33.3		66.7		0	

Table 4.4 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3		
		Total	%	Total	%	Total	%	Total	%	
Theme 5: Paradox of resource insufficiency										
1)	Paradox caused by insufficient resources	Paradox caused by insufficient resources	1	6.7	0	0.0	1	20.0	0	0.0
2)	Paradox caused by time pressure	Paradox caused by time pressure	2	13.3	1	20.0	1	20.0	0	0.0
3)	Paradox caused by workload pressure	Paradox caused by heavy workload	2	13.3	1	20.0	1	20.0	0	0.0
4)	Solutions to paradox of resource allocation	Reshuffling manpower	1	6.7	0	0.0	1	20.0	0	0.0
		Total counts	6		2		4		0	
		% of total counts	100		33.3		66.7		0	

Table 4.4 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3		
		Total	%	Total	%	Total	%	Total	%	
Theme 6: Paradox of learning										
1) Paradox caused by lack of knowledge and know-how	Paradox caused by lack of knowledge and know-how	1	6.7	0	0.0	1	20.0	0	0.0	
2) Solutions to lack of knowledge and know-how	Job rotation	1	6.7	1	20.0	0	0.0	0	0.0	
	Hiring new competency	3	20	1	20.0	2	40.0	0	0.0	
	Separation of functional expertise role and big picture perspective role	3	20	2	40.0	0	0.0	1	20.0	
	Total counts	8		4		3		1		
	% of total counts	100		50		37.5		12.5		

4.3.2.1 Theme 1: Paradox of Cross-Functional Collaboration vs. One's Own Performance

Cross-functional collaboration is required in innovation. However, for a non-innovation department to spend time and manpower collaborating with innovation project teams may reduce the capacity to maximize its own performance. This poses a paradox in managing for innovation and performance.

Nine meaningful expressions were extracted from the interviews which generated a category of 1) paradox caused by lack of collaboration; and 2) the solutions for the paradox, which comprises five codes, namely, (1) setting up KPI for collaboration; (2) utilizing integrated and cohesive cross-functional leadership teams; (3) alignment of relevant functions; (4) management calling for collaboration; and (5) enhancing communication and socialization among parties concerned

1) Paradox caused by Lack of Collaboration

Two companies said they had a certain concern in this issue, as expressed in the following quotations:

Interviewee 1-TA: “We often don’t get enough cooperation from the factory, like when we need to run tests on the actual production line, they do not always give us the priority because they do not want to stop their routine production lines to accommodate our tests.”

Interviewee 1-CA: “Silo mentality is hampering the innovation inside our company. It obstructed the full cooperation between business units. For example, a while ago, we helped co-creating a biodegradable product with an outsider. The product was later adopted for use by a company unrelated to us, while, in fact, the product could have been adopted by one of our business units who are in an exact same industry. But obviously because of the silo thinking among business units, the deal did not materialize.”

2) Solutions to the Paradox of Lack of Collaboration

(1) Setting up KPI for Collaboration

This refers to adding cross-functional collaboration as a KPI in the performance management system.

There was one company indicating the use of this solution to their problem as follows:

Interviewee 1-TA: “There are from time to time lack of collaboration from other functions. In an attempt to solve this lack of collaboration, inter-functional collaboration is specified as one of the KPIs of these staff, embedding collaboration as part of job description, not an unwelcomed burden on top of their routine duty.”

(2) Utilizing Integrated and Cohesive Cross-functional Leadership Teams

This refers to cohesiveness and closely integrated innovation leadership teams which comprises members from different functions to steer the innovation projects, as stated in the following.

Interviewee 1-CB: “When a conflict arises among innovation and other non-innovation departments regarding a project, usually it is easy to settle among related parties because of the frequent communication and collaboration they have. But if there are any needs for intervention, the leadership committee are there to do that. The committee comprise executives from various functions and are constantly communicating with one another, so they have sufficient information to make the best decisions on any issue that arises.”

(3) Alignment of Relevant Functions

This refers to the alignment of the value chain and other support functions in the companies for collaboration among the relevant departments.

Three companies specified this alignment as one of their management tactics for collaboration, as indicated in the following:

Interviewee 1-TA: “In strategic planning sessions, all departments gather in a workshop to plan alignment of their functions for the stated corporate strategies.”

Interviewee 2-UI: “Our production process is rather fixed, and the R&D people are all aware of that. They know what Production can or cannot do, so they take care not to create any new products that require drastic changes in the production processes.”

Interviewee 2-DE: “The big problem to solve was the flow of information. I [the BU head] solved that by having as many project members as possible to visit customers together, in order to be on the same page about the on-going situation. However, it is impossible to have all members to visit customers together at all times, so we installed interactive digital platform to update the information among the whole team so all can always access the information.”

(4) Management Calling for Collaboration

This refers to the intervention by the top management demanding collaboration from every party.

One company indicated this as a solution, as in the following.

Interviewee 1-TA: “CEO would then request everyone in the company to give full support for the innovation center when and where needed.

This in effect addressed the job conflict between innovation center and other functions and calls for collaboration among all parties concerned.”

(5) Enhancing Communication and Socialization among Parties Concerned

One company specified this intervention from HR department as a solution to the collaboration issue, as indicated in the following:

Interviewee 1-TA: “There are conflicts between Innovation Center and Factory who did not welcome changes that effected their work processes. HR set up communication channels and venues between Factory and Innovation Center in an attempt to get them to know each other more, to be familiar with each other’s role. They organized site visit at the innovation center for Factory to get the picture and understanding of the operation of Innovation Center.”

4.3.2.2 Theme 2: Paradox of Explorative and Exploitative Demands

Exploitative demands lead to efficiency while explorative demands lead to innovation.

There were eight meaningful expressions derived from the interviews, which, in turn, revealed two categories of paradox: 1) paradox caused by cost control; and 2) paradox caused by demands for speed; together with two categories of solutions for the paradoxes, namely, 3) solutions to cost control; and 4) solutions for demands of speed.

1) Paradox Caused by Cost Control

This paradox refers to the activity of cost control in the context of innovation which requires slack resources. One company mentioned this paradox in the following quotation:

Interviewee 1-CB: “Innovation people have no liking for cost control. We [the management] have to send in a different person or persons to do the cost control. And we help controlling cost by reducing the

number of projects from ten to five, for example. We might suggest going with the viable ones by first testing the ideas with our potential customers before anything.”

2) Paradox Caused by Demands for Speed

This paradox refers to the speedy execution of an innovation project. This is a paradox because speed is clearly an element of exploitative activities that enhances efficiency of execution, while innovation is an explorative activity which enhances search for novelty.

Three companies indicated speed in the respective quotations below:

Interviewee 1-CB: “Nowadays, size is not the advantage, but rather speed is. Being innovative is good, but it must be speedy. The first one to the market will consume all the budget of buyers, leaving no room for the buyers to buy later products even if it is better. We must be fast and first to the market.”

Interviewee 3-IN: “Small startup can turn out an application in just matter of weeks or days, while it takes longer time for as a solid company to produce one software. But the downside of the speedy creation of the application is often accompanied by lack of quality or reliability, it is prone with defects cropping up in the later stage. For us as an established company, we cannot risk our reputation by such sloppy software, we pay attention to the speed and quality of any software simultaneously.”

Interviewee 3-UI: “One major task of the innovation management is to manage for speed of early completion of an innovation project”

3) Solutions to Cost Control

One company described assigning cost-conscious persons to manage cost control as its solutions to cost control issue, as follows:

Interviewee 1-CB: "... We [the management] have to send in a different person or persons to do the cost control. And we help controlling cost by reducing the number of projects from ten to five, for example. We might suggest going with the viable ones by first testing the ideas with our potential customers before anything."

4) Solutions for Demands for Speed

Two solutions to the issue of speed were specified as: (1) investment for abundant facilities, and (2) simplification of processes.

(1) Investment for Abundant Facilities

Two companies cited this investment as their solution as follows:

Interviewee 3-UI: "In order to have speedy innovation process, we support R&D by heavily investing in all the equipment and facilities that they can conveniently use to speed up their innovation projects. While other companies may have 5 or 10 sets of the critical machine, we have over 100 sets of that machine."

Interviewee 3-JJ: "Whatever the staff want or need to work better, and faster, I [the CEO] will always consider investing in those things for them, be it hardware of software, or other facilities."

(2) Simplification of Processes

One company specifies simplification of processes as one solution:

Interviewee 1-CB: “Speed is made possible by simplification of things. We must iterate between process and simplification. We must look into what can be simplified; we can do that, for example, by combining processes.”

4.3.2.3 Theme 3: Paradox of Individual vs. Team Creativity

This theme refers to the tension of focus on individual vs. team creativity. Seven meaningful expressions were extracted from the interviews which revealed 1) paradox caused by lack of interpersonal skills, and 2) the solutions to the paradox.

1) Paradox Caused by Lack of Interpersonal Skills

Lack of interpersonal skills was referred to by the interviewees as lack of communication skill, relationship building, socialization, and was cited as an obstacle to interaction with other team members which might consequentially hamper the collaboration from other team members in brainstorming or expressing opinions on the individual’s initiative idea when it arises. Thus, it poses a paradox of individual vs. team creativity.

Two companies indicated this obstacle in the following remarks:

Interviewee 2-NN: “People in the innovation function tend to behave like a lone scientist working as a specialist alone in a laboratory. That contradicts the real world because innovation needs collaboration from many parties, interaction with other people is necessary in getting the job done smoothly. Therefore, it is imperative for innovation people to be friendly and have good interpersonal skills.”

Interviewee 1-SB: “These R&D staff are not good at communicating and socializing with other people especially those outside of their function. Therefore, we need to develop and embed these skills in them. Going out to meet customers is one way to develop the skills.”

2) Solutions to the Paradox of Individual vs. Team Creativity

Five meaningful expressions suggested two solutions, namely, (1) team brainstorming on an individual’s initiative ideas; and (2) team efforts in idea implementation.

(1) Team Brainstorming on an Individual’s Initiative Ideas

This solution attaches importance to both an individual’s and the team’s creativity. Two companies reflected on this issue in the following remarks:

Interviewee 2-NN: “My team members must initiate ideas that have at least 60-70% chance to succeed, not simply dreaming up whimsical ideas that have no chance of turning into reality. I would then feed the idea to be batted around by the team until a better idea is derived from the team brainstorming.”

Interviewee 2-DE: “Everyone works towards the team’s common goal; we are all professional here. Everyone has to contribute to the success of a project; therefore, all are free to raise up any ideas for the team to bat around until we get the best solutions for the project on hand.”

(2) Team Efforts in Idea Implementation

Three companies suggested this as their practice in dealing with an individual’s creative idea. Some examples are seen in the following remarks:

Interviewee 2-SL: “We nurture relation building, because any creative idea will materialize through cooperation of the team. Creative people

without good relationship with other team members can seldom get things done.”

Interviewee 2-NN: “...innovation needs collaboration from many parties, interaction with other people is necessary in getting the job done smoothly. Therefore, it is imperative for innovation people to be friendly and have interpersonal skills.”

4.3.2.4 Paradox of Change and Continuity

This theme discussed the paradox of accepting and adapting to changes as opposed to remaining steadfast and sticking to the status quo. Six companies expressed their ideas on 1) paradox caused by resistance to change; 2) solutions to resistance to change.

1) Paradox Caused by Resistance to Change

This category refers to resistance to change among exploitative functions. The resistance stems from the emphasis on performance rather than innovation. Resistance to change emerges from a tendency to stick to the tried-and-true methods of work, which ensures the work efficiency. Since innovation always involve changes, resistance to change thus hampers innovation; therefore, creates a paradox for the management to solve.

Three companies indicated they encountered this cause of the paradox in their organizations and expressed the ideas in the following remarks:

Interviewee 1-SA: “We [the company] have a long brand reputation to protect. At times, radical ideas that might fail and thus jeopardize our reputation are not encouraged. This may pose a hindrance to the development of new products that are deemed too radical and risky.”

Interviewee 2-SL: “As mentioned earlier, we have many employees who are long-timers working in the company since the beginning and are used to the old way of work. So, whenever we try to introduce new process of work, there will be many who are reluctant to change.”

Interviewee 2-DE: “The people here were happy with the way they worked before the new business model and innovation solutions were introduced in the organization. They showed resistance to the change because they felt the change added unnecessary burden to their work.”

2) Solutions to Resistance to Change

This refers to the practice of involving people and exposing them to innovation. Three companies gave their comments on the solutions they employed:

Interviewee 1-TA: “We solve the mindset issue by exposing these people to the outside world, to acquaint them with how the outside world has changed. So that when the innovation center comes up with some new product or process technology and introduce them to the production line, they will be more prepared for the changes, and show less resistance to the changes.”

Interviewee 2-SL: “When there is a change in the way of work happens, clear direction from above must be given and we must be persistent in pursuing the change until it completes. Even there is resistance to change, but with the persistence from the company, everyone will have to give in and change eventually.”

Interviewee 2-DE: “We [the business unit] set KPI for our sales teams to introduce the new innovative solutions to existing customers. We do not emphasize the success rate but rather focus on the number of times they do such offerings to customer. This would slowly acquaint them to the new way of work and the new innovative products/service which would overtime reduce the resistance to change.”

4.3.2.5 Paradox of Resource Insufficiency

This refers to the paradox of pressure from resource insufficiency vs. innovation. The resource can either be tangible or intangible. Six meaningful expressions gave rise to three categories of paradoxes, namely, 1) paradox caused by insufficient resources, 2) paradox caused by time pressure, and 3) paradox caused by workload pressure; and one meaningful expression explaining the fourth category: solutions to the paradox of resource insufficiency.

1) Paradox Caused by Insufficient Resources

This category refers to the paradox caused by insufficiency of the resources. One interviewee indicated this issue as a paradox encountered in the work unit:

Interviewee 2-NN: “The first obstacle that comes to my mind is about the limit of budget. Without sufficient budget for equipment and facilities, it is like pushing a rock up the hill to get the project completed speedily and smoothly.”

2) Paradox Caused by Time Pressure

This category refers to the pressure for early performance delivery from an innovation project. Two companies described this in the following remarks:

Interviewee 1-TA: “One of the obstacles in our innovation work is that other functions expect early result from us claiming that the company has invested a lot on this facility and so it should show performance very soon. That’ s the pressure on us.”

Interviewee 2-NN: “The obstacle to innovation is the time pressure. We all know that innovation needs creativity and creativity does not come by force but needs time and a free mind to incubate.”

3) Paradox Caused by Workload Pressure

This category refers to the paradox of having time for creative thinking vs. heavy workload pressure that hampers creativity.

Two companies reflected on the paradox in the following quotations.

Interviewee 1-TA: “Another challenge is the workload of some staff. If they are overburdened with routine jobs, they will not have time to think of development and improvements in the work process. We have to balance the workload of these staff so they could have more time to think of ways to improve their work processes.”

Interviewee 2-NN: “Over-workload is also another obstacle that we face. Because of the limitation on manpower, every staff have to juggle several projects at the same time and that slows down each project the person handles.”

4) Solutions for the Paradox of Resource Insufficiency

One code suggested reshuffling of manpower as a solution to address the obstacle from the resource pressures. This is briefly illustrated in the following remark:

Interviewee 2-NN: “In order to cope with the problem of insufficient manpower, I deploy staff to finish their primary task that only they can do and then shift them to help their colleagues do the jobs that can be done by anyone”

4.3.2.6 Theme 6: Paradox of Learning

This paradox refers to that of explorative and exploitative learning. Paradoxes of learning emerge when there are changes, renewal and innovation occurring in the dynamic systems. These paradoxes involve exploiting existing knowledge or creating new knowledge and abandoning the old one.

Eight meaningful expressions were extracted from the interviews, generating two categories: 1) paradox caused by lack of knowledge and know-how; and 2) solutions to the paradox of learning, namely, (1) job rotation; (2) hiring new competency; and (3) separation of functional expertise role and big picture perspective role

1) Paradox Caused by Lack of Knowledge and Know-How

This paradox was cited by Interviewee 2-NN as one of the obstacles they encountered. The following remark describes the idea:

Interviewee 2-NN: “And lack of knowledge or know-how is another obstacle that we face. This is especially the case with very new technology that we have never learned or knew of before.”

2) Solutions to the Paradox of Learning

Seven companies specified three practices they employed as solutions to the paradoxes of learning. These include (1) job rotation; (2) hiring new competency and (3) separation between functional expertise role and big picture perspectives role.

(1) Job Rotation

This method was employed as a means to expose employees to both the explorative and exploitative knowledge. Interviewee 1-SB stressed the use of this method in acquainting the staff to both types of functions in the company.

Interviewee 1-SB: “In my organization, because we have quite a number of R&D people, so we allocate some to focus on long term innovation, and some to focus on creating new product features to build up immediate sales volume. And we rotate the staff between those two functions to acquaint them with the fact that our business does not just focus on creating immediate sales or focus on only creating new knowledge for the long term.”

(2) Hiring New Competency

In filling the gap of knowledge lacking in organizations, one commonly employed method is to recruit new people with the new competency required of the job. Three companies stated they used this method to bring in new competencies, as follows:

Interviewee 2-DE: “It is fortunate for us that we can adopt innovation ideas from Japan for use in Thailand. because they have about 10 years’ experience ahead of us in this field. A year ago, we requested an experienced Japanese head from our head office in Japan to head the media innovation team and it works out very satisfactorily After recruiting the new head, we hired new team members to man the new digital based innovation unit.”

Interviewee 2-SL: “In filling the competencies gap, recently the policy is to recruit new staff with the competency and job experience that we do not have, even if that means paying more.”

Interviewee 1-TA: “When the company planned to build the innovation center, the management recruited the BU head from outside. This person has a long experience in the R&D of our field. He was entrusted with the task of setting up the whole facility and recruited the team members from various place both local and overseas.”

(3) Separation of Functional Expertise Role and Big Picture Perspective role

Three companies indicated the separation of the exploitative and explorative knowledge between frontline staff and the leaders. The following quotations describe the details:

Interviewee 1-CB: “R&D people normally have in-depth expertise in their disciplines, often lacking the big picture perspectives, while management have a bird’s eye view of various fields of knowledge, which is complementary to the expertise of team members.”

Interviewee 1-SB: “It is a good thing if leaders have field-specific expertise. However, leaders do not necessarily have more in-depth knowledge than the followers because the field develops quickly, they may not be able to keep up with the details. But it is required that they have a broad perspective, the sort that enables them to see the linkage between all elements of an innovation project and know the interaction between them.”

Interviewee 3-JJ: “I [CEO] have the overall picture of the project clearly in my head and can guide them to take an optimal course of action if any deviation seems to hamper the project.”

4.3.3 Research Question 3: “How do these Organizations Manage for Ambidexterity (Innovation and Efficiency)?”

This research question was to explore the antecedent factors of ambidexterity in the innovative high-performance organizations (iHPOs). The main interview question asked in the interview was, “How do you manage for both innovation and efficiency simultaneously?”

Eighty-seven meaningful expressions emerged from the content analysis of the interviews. These meaningful expressions produced six main themes of the antecedent factors, namely, 1) separation and dynamics of structure, 2) strategic management, 3) systems, 4) project control procedures, 5) leadership, and 6) knowledge.

Table 4.5 displays all the themes and the categories of antecedent factors of ambidexterity of all the company groups, as well as the frequency counts of each code.

Table 4.5 Antecedent Factors Enhancing Ambidexterity

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
Theme 1: Separation and dynamics of structure									
1) Spatial separation	Separated work unit for innovation	11	73.3	5	100.0	5	100.0	1	20.0
2) Structural alignment	Alignment of the value chain and supportive functions	2	13.3	1	20.0	1	20.0	0	0.0
	Total counts	13		6		6		1	
	% of total counts	100		46.2		46.2		7.7	
Theme 2: Strategic management									
1) Strategy for innovation	Setting directions for innovation	7	46.7	3	60.0	1	20.0	3	60.0
2) Ambidextrous strategy	Focusing corporate strategy on innovation and efficiency	11	73.3	5	100.0	3	60.0	3	60.0
3) Ambidextrous planning	Annual innovation goal setting and planning	2	13.3	2	40.0	0	0.0	0	0.0
4) Scenario planning	Thorough scenario planning	1	6.7	1	20.0	0	0.0	0	0.0
	Total counts	21		11		4		6	
	% of total counts	100		52.4		19		28.6	

Table 4.5 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3		
		Total	%	Total	%	Total	%	Total	%	
Theme 3: Performance systems										
1) Innovation talent management system	Innovation talent management system	3	20.0	1	20.0	2	40.0	0	0.0	
2) Performance management system	Performance management system	3	20.0	2	40.0	0	0.0	1	20.0	
	Total counts	6		3		2		1		
	% Of total counts	100		50		33.3		16.7		
Theme 4: Project control procedures										
1) Product development management tools	Agile methodology	2	13.3	0	0.0	0	0.0	2	40.0	
	Product lifecycle management software	1	6.7	1	20.0	0	0.0	0	0.0	
2) Project termination mechanism	Termination of unviable projects	3	20.0	2	40.0	1	20.0	0	0.0	

Table 4.5 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
3) Project resource management	Reshuffling resources and priority	3	20.0	2	40.0	1	20.0	0	0.0
	Budget control	4	26.7	1	20.0	2	40.0	1	20.0
	Timeline control	6	40.0	1	20.0	2	40.0	3	60.0
4) Regular project progress appraisal	Regular project progress appraisal	2	13.3	1	20.0	0	0.0	1	20.0
5) Collaboration management	Setting KPIs for collaboration	2	13.3	0	0.0	2	40.0	0	0.0
6) Quality management	Quality control in every innovation stage	3	20.0	1	20.0	0	0.0	2	40.0
7) Project feasibility screening	Up-front project feasibility screening	7	46.7	4	80.0	2	40.0	1	20.0
	Total counts	33		13		10		10	
	% of total counts	100		39.4		30.3		30.3	

Table 4.5 (Continued)

Categories	Codes	Overall-Group		Group-1		Group-2		Group-3	
		Total	%	Total	%	Total	%	Total	%
Theme 5: Leadership									
1) Ambidextrous leadership	Focus on both innovation and business performance	2	13.3	1	20.0	0	0.0	1	20.0
2) Leadership team	Management by committee	5	33.3	4	80.0	1	20.0	0	0.0
	Integration and cohesiveness of innovation management team	4	26.7	3	60.0	1	20.0	0	0.0
	Total counts	11		8		2		1	
	% of total counts	100		72.7		18.2		9.1	
Theme 6: Knowledge									
1) Separation of functional expertise role and big picture perspective role	Separation of functional expertise role and big picture perspective role	3	20.0	2	40.0	0	0.0	1	20.0
	Total counts	3		2		0		1	
	% of total counts	100		66.7		0		33.3	

4.3.3.1 Theme 1: Separation and Dynamics of Structures

This theme refers to the separation and dynamics between efficiency-focused and innovation-focused structures of the companies in this study. The answers to the interview question yielded 13 meaningful expressions and two categories: 1) spatial separation, and 2) alignment of relevant functions

1) Spatial Separation

This category refers to the physical separation of the innovation work unit from other functions.

Eleven companies indicated they had separate physical structure for the innovation function. Some of the following interview quotations illustrate the separation:

Interviewee 2-DE: “To cope with the digital media transformation, the company has seriously set up a separate function to offer new solutions to our clients. The head of this department is from Japan. He is very well experienced in this field of digital media solutions.”

Interviewee 1-TA: “We set up our research facility in this university campus [at different location from the company], we treat it as an innovation incubator. The research facility concentrates on developing breakthrough products mainly for international market and also develop new production technology for use in our factories.”

Interviewee 3-IN: “Instead of creating a new start up, we set up a new business unit, much like a startup, to handle the business of creating this new product [which was just launched] and commercialize it.”

Interviewee 2-NN: “Our company clearly separate R&D function as a separate department. We [R&D] do various product developments in two main product lines.”

2) Alignment of Relevant Functions

This refers to the aligning of the value chain and supportive functions in the companies to operate seamlessly and smoothly in execution for the daily operations and the innovation efforts from inception of ideas through to the commercialization stage.

Two companies described briefly their ideas in regard to the structural elements as follows:

Interviewee 2-UI: “Our production process is rather fixed, and the R&D people are all aware of that. They know what Production can or cannot do, so they take care not to create any new products that require drastic change in the production process.”

Interviewee 1-TA: “In strategic planning sessions, all departments gather in a workshop to plan alignment of their functions for the stated corporate strategies.”

4.3.3.2 Theme 2: Strategic Management

This theme refers to the corporate strategic management. The content analysis yielded 22 meaningful expressions resulting in three categories, namely, 1) strategy for innovation, 2) ambidextrous strategy 3) ambidextrous planning, and 4) scenario planning.

1) Strategy for Innovation

This category includes the role of a leader in setting directions for the innovation of the company and to incorporate it into the corporate strategy and core values. This will serve as a guiding principle to align the operations of the company.

Eight companies indicated this as an antecedent factor for their performance and innovation. They described the significance of this factor as follows:

Interviewee 1-CA: “We must know what we want from doing an innovation, not just innovate for the sake of innovation, but we must know what end business result we will get from the innovation. Leaders must provide directions for this.”

Interviewee 3-JJ: “More often than not, I [CEO] am the one to shape the future of what innovation to pursue. This is because I have more insight than the young staff. For young staff their creative ideas do not actually materialize into something commercializable.”

Interviewee 1-TA: “It’s important for the company to give the directions as to how the company should proceed in all forms of innovation.”

Interviewee 2-NN: “In capable teams, we will give them broad scope of the innovation project and let them operate freely on their own to achieve the objectives.”

Interviewee 3-GG: “Leaders set directions for innovation project team to use as guideline in their activities.”

Interviewee 3-IN: “Normally when it comes to making a decision of what innovation to pursue, top management is the one to decide what directions to go.”

2) Ambidextrous Strategy

This category refers to the ambidextrous focus of corporate strategy on both innovation and performance efficiency. Eleven companies reflected this ambidexterity focus in their strategy. The following quotations imply this concept.

Interviewee 1-CA: “Every innovative organization wants the same things. The leaders want new innovation, new products, new service that

are successful, and at the same time they also care for growth, profit, stock price, brand reputation, etc.”

Interviewee 2-DE: “We [a media company] set KPI for our sales teams to introduce the new innovative solutions to existing customers. We do not emphasize the success rate but rather focus on the number of times they do such offerings to customer.”

3) Ambidextrous Planning

This category refers to the practice of annual goal setting and planning to review the performance efficiency and innovation progress.

Two companies demonstrated how they went about with the planning process as follows:

Interviewee 1-CB: “In our annual corporate strategic meeting, all functions share information which will be used to review and formulate corporate innovation strategies.”

Interviewee 1-TA: “In our performance management system, we include Goal Setting in the process. At the end of the year, we hold a planning workshop for top management to brainstorm for the vision and ideal target together with the achievable targets. Then we have another workshop for BU heads and the managers to cascade the corporate targets down in their respective business units and create action plans to achieve the target.”

4) Scenario Planning

One company stressed the importance of thorough scenario planning for an innovation project so as to simulate what could go wrong.

Interviewee 1-CB: “It’s OK to think very thoroughly in the [innovation] planning stage so that we are well prepared to solve possible problems when they really occur.”

4.3.3.3 Theme 3: Systems

This theme refers to the performance management systems employed in these innovative high-performance companies.

Five meaningful expressions from the content analysis accounted for two categories of systems: 1) innovation talent management system, and 2) performance management system.

1) Innovation Talent Management System

This category refers to the talent management system utilized in the development and retention of innovation talents.

Three companies indicated they had the talent management system of some sort to ensure talent presence in the companies, as recounted in the following quotations:

Interviewee 1-CB: “Though we encourage innovation at all levels, we are selective in grooming innovation champions. We have each BU select high-potential people whom we will groom by putting them through various training and development such as TRIZ training which is held every 8 months. They have homework, examination and a real project to finish within 6 months. We select only talents to go through this ordeal.”

Interviewee 1-TA: “We have performance appraisal for talent, which is carried out every 6 months.”

Interviewee 2-DE: “I [BU head] have the authority to promote talent so as to keep them in our company. Like in one case, one of my top team members was offered a better package from our competitor. I bypassed all the formal procedure and match the offer to finally retain the person

with us. and beside we have talent learning and development program to empower these talents to keep their motivation high.”

2) Performance Management System

This refers to performance management system used to manage the performance of all staff across organization. It plays a vital role in enhancing performance and innovation efforts in all departments.

Three companies indicated the use of comprehensive performance management system across all departments as reflected in the following quotations:

Interviewee 1-TA: “Our company assign various KPIs in various functions such as productivity per head, sale per head, net profit, tonnage (of raw material) per head or percentage of cost saving, reduction in expenses etc. When the management give directions as to either increase or decrease these KPI, each department will then have to think up better ways to process their work to reach the targets set out for them.”

Interviewee 3-GG: “Our company [IT company] set KPIs to manage performance of all staff including those in the solutions development function.”

Interviewee 1-SA: “We base our performance management system on a matrix structure, in a cross-functional environment, where a person’s performance is evaluated by his functional boss as well as his project boss.”

4.3.3.4 Theme 4: Project Control Procedures

This theme discusses the importance of managing for efficiency in innovation efforts, which illustrates the management of paradoxical elements of innovativeness and performance control. The data for analysis were derived from the answers to the interview question, “How do you manage for efficiency against the backdrop of innovativeness?”

Thirty-four meaningful expressions were extracted from the interviews resulting in seven categories concerning the practices of efficiency management in innovation functions. These categories are: 1) product development management tools, 2) project termination mechanism, 3) project resource management, 4) project efficiency management, 5) collaboration management, 6) quality management, and 7) project feasibility screening.

1) Product Development Management Tools

This category refers to the various management tools and method employed in the iHPOs to manage for efficiency of innovation projects. Included in this category are (1) Agile methodology, and (2) product lifecycle management software.

(1) Agile Methodology

One of the common tools mentioned in high-tech related companies in the study was Agile methodology. This was adroitly utilized in at least two high-tech companies as indicated in the quotations as follows:

Interviewee 3-LL: “We manage a project work by following Agile methodology. This is a proven method for software development project where changes occur almost on a daily basis.”

Interviewee 3-JJ: “On the innovation dimension of a project, I keep on feeding them new knowledge, new developments in technology. And at the same time, we utilize several work tools to enhance efficiency such as Agile, Kanban, Kaizen etc. this will help manage efficiency dimension of the projects.”

(2) Product Lifecycle Management Software

This was mentioned by one manufacturing and trading company who use this software to track the efficiency of an innovation along the path from inception to the commercialization providing data for effective decision-making regarding the new products, as illustrated in the quotation as follows:

Interviewee 1-CB: “This is new product life cycle management program to monitor the performance of any new product from beginning. The data derived help the management to make the right decision regarding the business of the new product whether to go ahead or put an end to it. This software links all related functions to view the same data so as to have the same picture of the project progress.”

2) Project Termination Mechanism

This refers to the management practices in putting an end to an innovation project in order to stop wasting resources on an unviable project and deploy the resources for use elsewhere.

Three companies mentioned the mechanism presence in one form or another to put an end to a losing project. The following quotation give more details:

Interviewee 1-SB: “There are monthly meetings where they update on movement of each project. They meet to evaluate the viability of projects, so as to terminate the ones that do not show signs of viability.

Interviewee 1-TA: “If over time the research does not produce result as expected, we have to terminate it and look for new ways to work.”

Interviewee 2-UI: “Management also have to monitor the viability of each innovation. If a project does not meet the deadline, showing no sign of further progress whatsoever, the management will intervene to

put those projects on hold and reshuffle the priority to other projects in the pipeline.”

3) Project Resource Management

This category involves the effective utilization of resources which, at some point, are limited, whatever the size of the companies. Effective and efficient utilization of resources are mentioned as key factors in managing for innovation and efficiency. There are three codes included in this category, namely, (1) reshuffling resources and priority; (2) budget control; and (3) timeline control.

(1) Reshuffling Resources and Priority

This code indicates the management of resources and the prioritization of promising innovation projects, so as to maximize the effectiveness and efficiency of corporate resource utilization.

Three companies reflected on this antecedent factor in the following remarks.

Interviewee 1-CB: “If the new product project does not show sign of profitability, it will have to be put on the shelf. The resources will be deployed for effective use in other projects. The project will serve as the source of learning, though.”

Interviewee 2-UI: “[Regarding the efficient use of resources] In the R&D department themselves, they have to manage the priority of facility usage and the length of usage so as to maximize the efficiency of the facilities and the time management.”

Interviewee 1-SB: “If a project does not prove viable, then the committee will call it off and shift the resources and manpower to other more potential projects.”

(2) Budget Control

This code refers to the management of budget in any project. It reflects the concerns and focus of companies on the efficient utilization of capital and resources even for innovation. This exhibits the management of paradox of slack resource and limitation of resource.

Four companies reflected on this practice for efficiency in their management for innovation, as follows:

Interviewee 3-IN: “There was a detrimental failure in one project. After a careful review and reflection, we found the causes of failure, i.e. overcommitting ourselves, adding in additional features requirement from the client, and the lack of close budget monitoring, lack of strict project timeline management. That’s a good lesson learned for us. Now we manage it strictly in terms of project objectives, direction, budgeting and timeline management.”

Interviewee 1-SA: “Management allocate budget for innovation projects to manage independently on their own.”

Interviewee 2-NN: “We have to manage the budget within the budget estimates that we submit to the management.”

(3) Timeline Control

This code refers to the management of project schedule to ensure on- time delivery of final output of a new product development project.

Six companies shared their insight on this issue in the following quotations.

Interviewee 3-LL: “Setting up milestone and the management is important for us in bringing a project to its fruition. It’s the tool to manage the efficiency of a project.”

Interviewee 1-TA: “They [project leaders] must set directions for the innovation efforts and layout the priority of each elements and the timeline.”

Interviewee 2-PR: “To manage the time-efficiency of a project, we need to set some sort of milestones or deadline. At the early stage, we do not rush anything, only at the final stage that we will speed up to meet deadlines.”

Interviewee 2-UI: “We set KPI for R&D in terms of the number of products in the pipeline to turn into finished products that could pass the government authority tests. This affects both the speediness and the effectiveness of the innovations.”

4) Regular Project Progress Appraisal

This refers to the management of efficiency of a project by means of regular appraisal of project progress to be vigilant of any deviation that may arise so as to remedy it accordingly.

Two companies stated they had this practice in place to monitor a project progress, as follows:

Interviewee 1-TA: “We monitor the progress of any project continually. If we feel we have arrived at the impasse, we have to consider changing course or put an end to it.”

Interviewee 3-GG: “We evaluate any innovation project periodically. If it turns out OK at one stage, then we invest more for the next stage.”

5) Collaboration Management

This category refers to the enhancement of collaboration which is necessary for innovation. It includes setting KPIs for collaboration to ensure that every staff pay attention to the matter of collaboration. Two companies stated they used KPIs to set the tone for collaboration among departments:

Interviewee 2-UI: “We set KPI for all support function for collaboration in enhancing the speed of innovation projects, such as the KPI for prompt response to request for raw material for experiments in R&D.”

Interviewee 2-DE: “Each sales group is assigned KPIs for pushing this new solution into the market.”

(6) Quality Management

This category is about quality control in every stage of an innovation project to ensure that quality is manifested in the finished product. This is in contrast to the endeavor for hasty product launch, downplaying or neglecting the quality aspect of the product.

Three companies expressed their concern in quality management issue in their innovation projects. This is reflected in the following quotations.

Interviewee 3-IN: “Small startup can turn out an application in just matter of weeks of days, while it takes longer time for an established company to produce one software. But the downside of the speedy creation of the application is often accompanied by lack of quality or reliability, it is prone with defects cropping up in the later stage. For us as an established company, we cannot risk our reputation by such sloppy software, we pay attention to the speed and quality of any software simultaneously.”

Interviewee 1-SA: “Fundamentally, our company means quality in every stage ranging from design stage, production process which include raw material procurement. This is based on TQM principles.”

Interviewee 3-DI: “We follow Japanese style in that we spend only 25% of our efforts in coding and over 50% on ensuring the top quality of our products.”

(7) Project Feasibility Screening

This refers to the feasibility study of a project proposal so as to objectively consider the possibility of success and the return on investment of an innovation project. This is done up-front before the decision to go or not to go with the innovation proposal. Seven companies inferred or implied this practice in their remarks as follows:

Interviewee 2-SL: “With the management committee in place, flexibility is the thing of the past. In order to get approval for a project, now we have to do careful feasibility study to answer the board in various dimensions, because the committee consist of members from various backgrounds. In the past we had only to convince one or two top managers. And when the project came out all right, we would be relieved and thought we were lucky to pull through. But now with the committee system in place, getting approval from the board is in itself a very sure proof that the project is a viable one.”

Interviewee 1-CA: “We have our own criteria for selection of innovation projects to implement. These criteria are: initiative, difficulty to duplicate by competitors, quality, novelty; market trend; market size; market share; return on investment; value for customers, benefits for stakeholder and the country; competitive price and cost; production capacity or readiness.”

Interviewee 1-CB: “In screening innovation project we first evaluate the cost estimate, the chance of success and finally make a demo to gauge responses from customers before deciding on pursuing the innovation project.”

Interviewee 3-DI: “We never experienced any failed projects. Because we will kill it in the study phase if we and the management agree that the chance of success is dim.”

4.3.3.5 Theme 5: Leadership

This theme refers to the leadership for ambidexterity.

Twelve meaningful expressions were derived from the content analysis, forming two categories of leadership issues: 1) ambidextrous leadership, and 2) leadership team.

1) Ambidextrous Leadership

This category portrays the ambidextrous leadership who focuses on both innovation and business performance.

Two companies indicated this leadership traits in the following quotations:

Interviewee 1-CA: “Every innovative organization wants the same things. The leaders want new innovation, new products, new service that are successful, and at the same time they also care for growth, profit, stock price, brand reputation, etc.”

Interviewee 3-IN: “Leaders [of IT companies] who are innovative must also pay attention to the performance of the business. While being visionary, he must also focus on the business performance, concentrating on the business side of the projects on hand.”

2) Leadership Team

This category refers to the management teams or the heads of BU that form a management team. Ten meaningful expressions generated two codes in this category, namely, (1) management by committee, and (2) integration and cohesiveness of innovation management teams.

(1) Management by Committee

This code refers to utilizing a committee in innovation management. Five companies indicated this practice in their organizations; some of the quotations are shown below.

Interviewee 1-CB: “We started innovation management by trial and error and iteration, that lead eventually to setting up of innovation committee with clear policy. Under this integrative committee setup, business units have been facilitated to cooperated and share information of what each is doing.”

Interviewee 1-TA: “Any new product innovation ideas must go through the scrutiny of a committee comprising of various management functions, for example Marketing, Finance, Factory. They will evaluate the feasibility of the new projects. If they agree on the potential of the proposed new products, they give the go-ahead.”

Interviewee 2-SL: “Earlier on when we were small and a private company, major investment decisions were made by the owner. But now since we are a listed public company any major investments on innovation have to go through management committee comprising of almost 10 people, it is much more difficult to convince the committee than before. We will have to answer to many more questions from different people. To get an approval is much more difficult than before.”

Interviewee 1-SB: “The innovation management is executed by committee, who has high flexibility and mobility who can convene meetings at any time.”

(2) Integration and Cohesiveness of Innovation Management Teams

This category refers to the unity of an innovation management teams despite being from different work function in a company.

Four companies described this in the interviews. Some of them are shown in the following quotations.

Interviewee 2-SL: “When a problem or conflict arises, the leaders can come together and discuss on the solutions. The solutions to the problem might be that some parties will have to give, others will have to adjust the work, or we might agree to stop this product and switch to others.”

Interviewee 1-CB: “A steering committee makes innovation policies for working groups to implement. Because it consists of members from disparate business units, the committee must communicate closely to update each other on the happenings in their units so as to synchronize the overall understanding and efforts of the team.”

Interviewee 1-SB: “Committee members are from different functions, but they communicate closely with one another, and they hold regular meetings to update and make decisions; they cooperate well as a team.”

4.3.3.6 Theme 6: Knowledge

This theme refers to the knowledge in the sense of being explorative or exploitative in nature.

Three meaningful expressions were extracted from the content analysis of the interviews forming only one single category of the theme. The category refers to separation of knowledge focus into functional expertise and big picture perspective skills.

The three companies expressed their insights on this issue as in the quotations below.

Interviewee 1-CB: “R&D people normally have in-depth expertise in their disciplines, but often lack the big picture perspectives, while management have a bird’s eye view of various fields of knowledge, which is complementary to the expertise of team members.”

Interviewee 1-SB: “It is a good thing if leaders have field-specific expertise. However, leaders do not necessarily have more in-depth knowledge than the followers because the field develops quickly, they

may not be able to keep up with the details. But it is required that they have a broad perspective, the sort that enables them to see the linkage between all elements of an innovation project and know the interaction between them.”

Interviewee 3-JJ: “I have the overall picture of the project clearly in my head and can guide them to take an optimal course of action if any deviation seems to hamper the project.”

4.3.4 Research Question 4: “What is a Possible Ambidextrous Model of Innovative High-Performance Organizations in Thailand?”

The findings from the interview of 15 high-ranking executives who were involved in innovation of their organizations revealed substantial amount of insight regarding the antecedent factors of innovation, the paradoxes of innovation vs. efficiency activities and their solutions, and the antecedent factors of organizational ambidexterity. Full details are discussed in Chapter 5.

The emerging new conceptual framework was a departure from the literature review. The antecedents of innovation, the paradoxes and the solutions, and the antecedent factors of management of both innovativeness and efficiency were combined into an intertwined system.

The new conceptual framework emerged from putting together eight themes of innovation antecedents, six themes of the paradoxes and their solutions, and lastly, six themes of antecedents of organizational ambidexterity. The following tables give an overview of the themes, categories and codes formulated from the findings of each research question.

Full details of the new framework are discussed in Chapter 5.

4.3.5 Comparison of Findings from Each Group of Companies

Following are the tables displaying 10 highest ranked antecedent factors from the findings of the three research questions.

Table 4.6 RQ1: Overall-Group Top 10 Ranked Antecedent Factors of Innovation

Antecedent Factors of Innovation	Frequency	Percentage
Support for opportunities and resources	13	86.7
Showing passion and/or involvement in innovation	12	80.0
Cross-functional project teams	11	73.3
Functional expertise	11	73.3
Internal spatial separation of structure	11	73.3
Customer insight and market intelligence	9	60.0
Keeping pace with the latest technology	9	60.0
Technological changes	9	60.0
Flat structure	8	53.3
Innovation as strategy/core- value	8	53.3

Table 4.7 RQ1: Group-1 Top 10 Ranked Antecedent Factors of Innovation

Group-1 Antecedent Factors of Innovation	Frequency	Percentage
Innovation as strategy/core- value	5	100.0
Innovation contest	5	100.0
Internal spatial separation of structure	5	100.0
Support for opportunities and resources	5	100.0
Cross-functional project teams	4	80.0
Functional expertise	4	80.0
Joint innovation with external parties	4	80.0
Showing passion and/or involvement in innovation	4	80.0
Being visionary and communicating the vision	3	60.0
Customer insight and market intelligence	3	60.0

Table 4.8 RQ1: Group-2 Top 10 Ranked Antecedent Factors of Innovation

Group-2 Antecedent Factors of Innovation	Frequency	Percentage
Internal spatial separation of structure	5	100.0
Customer insight and market intelligence	4	80.0
Showing passion and/or involvement in innovation	3	60.0
Keeping pace with the latest technology	3	60.0
Flat structure	3	60.0
Good co-ordination between functions	3	60.0
Adaptability to changes in task environment	3	60.0
Experiment-orientation, trial and error	3	60.0
Self-learning	3	60.0
Cross-functional project teams	2	40.0

Table 4.9 RQ1: Group-3 Top 10 Ranked Antecedent Factors of Innovation

Group-3 Antecedent Factors of Innovation	Frequency	Percentage
Support for opportunities and resources	5	100.0
Showing passion and/or involvement in innovation	5	100.0
Cross-functional project teams	5	100.0
Functional expertise	5	100.0
Keeping pace with the latest technology	5	100.0
Technological changes	5	100.0
Training or taking innovation courses	4	80.0
Taking responsibility and committed to his job	4	80.0
Awareness of the latest business trends	4	80.0
Being visionary and communicating the vision	3	60.0

Table 4.10 RQ2: Overall-Group Top Ranked Elements of Paradoxes and Solutions

Paradoxes of Innovation and Efficiency	Frequency	Percentage
Paradox caused by demands for speedy completion of innovation projects	3	20.0
Paradox caused by resistance to change	3	20.0
Paradox caused by lack of cooperation from other functions	2	13.3
Paradox caused by lack of interpersonal skills	2	13.3
Paradox caused by time pressure	2	13.3
Paradox caused by heavy workload	2	13.3
Paradox caused by cost control	1	6.7
Paradox caused by insufficient resources	1	6.7
Paradox caused by lack of knowledge and know-how	1	6.7

Table 4.11 RQ2: Group-1 Top Ranked Elements of Paradoxes and Solutions

Group-1 Paradoxes of Innovation and Efficiency	Frequency	Percentage
Paradox caused by lack of cooperation from other functions	2	40.0
Paradox caused by demands for speedy completion of innovation projects	1	20.0
Paradox caused by resistance to change	1	20.0
Paradox caused by lack of interpersonal skills	1	20.0
Paradox caused by time pressure	1	20.0
Paradox caused by heavy workload	1	20.0
Paradox caused by cost control	1	20.0

Table 4.12 RQ2: Group-2 Top Ranked Elements of Paradoxes and Solutions

Group-2 Paradoxes of Innovation and Efficiency	Frequency	Percentage
Paradox caused by resistance to change	2	40.0
Paradox caused by demands for speedy completion of innovation projects	1	20.0
Paradox caused by lack of interpersonal skills	1	20.0
Paradox caused by time pressure	1	20.0
Paradox caused by heavy workload	1	20.0
Paradox caused by insufficient resources	1	20.0
Paradox caused by lack of knowledge and know-how	1	20.0

Table 4.13 RQ2: Group-3 Top Ranked Elements of Paradoxes and Solutions

Group-3 Paradoxes of Innovation and Efficiency	Frequency	Percentage
Paradox caused by demands for speedy completion of innovation projects	1	20.0

Table 4.14 RQ3: Overall-Group Top 10 Ranked Antecedent Factors of Ambidexterity

Antecedent Factors of Ambidexterity	Frequency	Percentage
Focusing corporate strategy on innovation and efficiency	11	73.3
Separated work unit for innovation	11	73.3
Setting directions for innovation	7	46.7
Up-front project feasibility screening	7	46.7
Timeline control	6	40.0
Management by committee	5	33.3
Budget control	4	26.7
Integration and cohesiveness of innovation management team	4	26.7
Innovation talent management system	3	20.0
Performance management system	3	20.0

Table 4.15 RQ3: Group-1 Top 10 Ranked Antecedent Factors of Ambidexterity

Group-1 Antecedent Factors of Ambidexterity	Frequency	Percentage
Separated work unit for innovation	5	100.0
Focusing corporate strategy on innovation and efficiency	5	100.0
Up-front project feasibility screening	4	80.0
Management by committee	4	80.0
Setting directions for innovation	3	60.0
Integration and cohesiveness of innovation management team	3	60.0
Performance management system	2	40.0
Termination of unviable projects	2	40.0
Reshuffling resources and priority	2	40.0
Separation of functional expertise role and big picture perspective role	2	40.0

Table 4.16 RQ3: Group-2 Top 10 Ranked Antecedent Factors of Ambidexterity

Group-2 Antecedent Factors of Ambidexterity	Frequency	Percentage
Separated work unit for innovation	5	100.0
Focusing corporate strategy on innovation and efficiency	3	60.0
Up-front project feasibility screening	2	40.0
Timeline control	2	40.0
Budget control	2	40.0
Innovation talent management system	2	40.0
Setting KPIs for collaboration	2	40.0
Setting directions for innovation	1	20.0
Management by committee	1	20.0
Integration and cohesiveness of innovation management team	1	20.0

Table 4.17 RQ3: Group-3 Top 10 Ranked Antecedent Factors of Ambidexterity

Group-3 Antecedent Factors of Ambidexterity	Frequency	Percentage
Focusing corporate strategy on innovation and efficiency	3	60.0
Setting directions for innovation	3	60.0
Timeline control	3	60.0
Quality control in every innovation stage	2	40.0
Agile methodology	2	40.0
Separated work unit for innovation	1	20.0
Up-front project feasibility screening	1	20.0
Budget control	1	20.0
Performance management system	1	20.0
Separation of functional expertise role and big picture perspective role	1	20.0

A discussion of the findings in this chapter and recommendations for future research are presented in Chapter 5.

CHAPTER 5

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter provides a summary of the research, and presents a conclusion and discussion, applications for scholars and practices, as well as the limitations of the study and recommendations for future research and practice.

5.1 Summary

Extant literature on innovation has focused mostly on how to build an innovative organization. Few touches on the challenges arising from managing simultaneously for innovation and efficiency, and the obstacles encountered in the process of managing for such. The purpose of this study was to explore the management and leadership of innovation and efficiency concurrently, the concomitant paradoxes and their solutions. The research questions ensuing from the purpose of the study are illustrated as follows:

- 1) What are the structure, context, culture that enhance innovation in innovative and high-performance organizations?
- 2) What are the paradoxes encountered and overcome in achieving both innovativeness and efficiency (ambidexterity)?
- 3) How do these organizations manage for ambidexterity (innovation and efficiency)?
- 4) What is a possible ambidextrous model of innovative high-performance organizations in Thailand?

Multiple case study was employed as the qualitative methodology of this research. In-depth interviews and non-participant observations were used as main methods for data collection. There were 15 case companies selected based on the purposive sampling technique. The technique was well suited for a small number of

participants who were particularly insightful and informative regarding the subject matter (Neuman, 2005). These 15 companies were well-regarded for their innovative and high-performance by being a recipient of one or more innovation awards and having a strong balance sheet. Some were listed on the Stock Exchange of Thailand (SET) and the Market for Alternative Investment (MAI), others were non-listed companies who were well established for over 20-90 years and evidently recognized for their innovativeness and high-performance. All interviewees were the executives engaged in innovation activities and were in good position to offer insights on the management of innovation in the companies. All the interviews were carried out between Jun 28 and August 29, 2018.

The key findings from the interview content analysis yielded various themes for each research question producing a new conceptual framework differing to some extent from the preliminary one which had been formulated from the literature. The summary of the findings from each research question is laid out as follows:

First, in regard to Research Question 1 which intended to explore the antecedent factors in terms of structure, context, culture and leadership, that enhance innovation in innovative and high-performance companies (iHPOs), the findings yielded eight themes as follows: 1) structure, 2) systems-process-tools, 3) staff, 4) human resource development (HRD), 5) leadership, 6) organizational climate and culture, 7) knowledge, and 8) external environmental elements.

Second, the answers to Research Question 2 seeking to know the paradoxes encountered and overcome in achieving both innovativeness and efficiency (ambidexterity), revealed six themes of paradoxes together with the solutions as follows: 1) paradox of cross-functional collaboration vs. one's own performance; 2) paradox of explorative vs. exploitative activities; 3) paradox of individual vs. team-based creativity; 4) paradox of change vs. continuity; 5) paradox of long-term vs. short-term focus; and 6) paradox of learning.

Third, the answers to Research Question 3, intended for exploration of the antecedent factors of organizational ambidexterity that speaks to the needs of managing for innovativeness and performance efficiency simultaneously, revealed six main themes of the antecedent factors, namely, 1) structure, 2) strategic management, 3) systems, 4) project control procedures, 5) leadership, and 6) knowledge.

Forth, findings from Research Questions 1-3 formed the answer to Research Question 4 which asks for a possible ambidextrous model of innovative high-performance organizations in Thailand. Discussion on the result for Research Question 4 is presented in full as in the following.

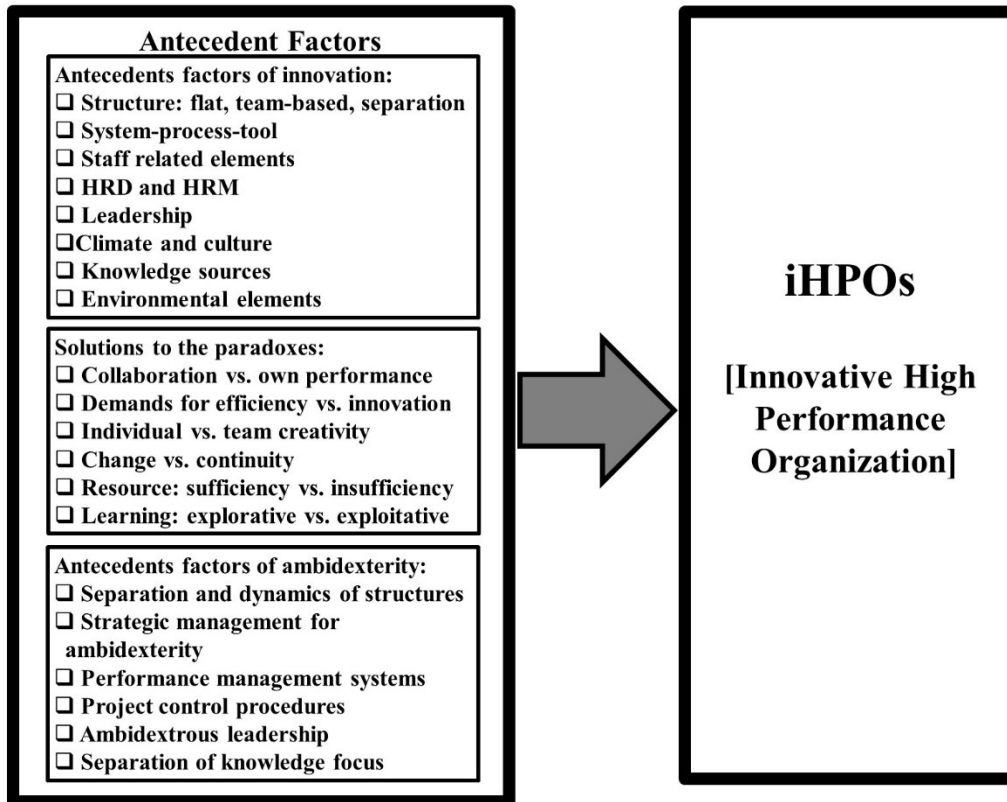


Figure 5.1 The New Conceptual Framework

The data analysis indicates a new framework of ambidexterity management of iHPOs in Thailand. The essential difference of the new and old frameworks lies basically at the perception of the relation between innovation and efficiency. The new framework treats efficiency as an integral part of innovation management, not as a paradox in the sense of contradiction obstructing the work of innovation. Rather managing for efficiency is embedded congruently in the process of project control procedures, or in other words, project management.

One major difference is the re-classification of the independent variables into three new categories: 1) antecedent factors of innovation, 2) solutions to the paradoxes uncovered from the interviews, and 3) antecedent factors of ambidexterity which enhance efficiency and innovation; these replace the original groups of independent variables, namely, structural, contextual, and leadership factors. The new approach gives a better idea of what activities to manage, not what objects to manage. and thus, move the focus closer on the ends, away from the means. The new framework takes into consideration antecedent factors of innovation that must be instilled in organizations first thing; this almost unavoidably brings about the concomitant paradoxes with the existing exploitative elements indigenous to efficiency-driven organizations. Various solutions to the paradoxes were indicated by the participants and have been factored in as antecedent elements on the independent variable side. Lastly, the factors that address the efficiency issue in the management for innovation were identified and included as the antecedents of ambidexterity. This new structuring approach was in contrast to the arrangement of original framework where paradoxes to be balanced were positioned at the right side of the framework which might conduce to the misinterpretation that success in solving the paradoxes alone would result in iHPOs. In fact, it was clear from the findings that a company needs to simultaneously manage: 1) the antecedent factors of innovation, 2) the solutions to the paradoxes encountered, and 3) the antecedent factors of efficiency in innovation management. However, despite the difference in the structuring of the frameworks, almost all the individual items coincides with those in the original framework. Among the new items revealed from the study are mechanism/tool for idea generation and motivation to innovate, and project control procedures. Project control procedures are specifically an important theme factored into the framework; a total of thirty-four meaningful expressions from the interviews discussed the importance of this factor in managing for efficiency in innovation projects.

5.2 Limitations of the Study

Although this research has contributed some beneficial findings to the body of literature in this field of innovation and ambidextrous management, there are still some limitations in the study that need considerations.

First, this research was a qualitative epistemology, conducted through only interviews and observation as its major research methods. The researcher reported the findings based on the results derived during the interviews. However, the interview was considered a self-report where the results hinged on the openness of the interviewees. The answers derived from each person might have been stated with an attempt of impression management to look good for various reasons, and some of the points that the interviewees deemed inappropriate for disclosure may not have been brought up in the interviews.

Second, the number of participating companies were only fifteen in all with only one interviewee from each, and they were all high-ranking executives. In order to ensure accuracy and enable the triangulation of the findings, additional interviewees at the lower layers of the operation should be included, and to be more able to generalize the findings, the number of participating companies could be increased.

Last, although the researcher intended to minimize bias in this dissertation, questions about the subjectivity to a certain degree should not be ruled out.

5.3 Discussion of the Research Findings

This section discusses the research findings in light of Research Questions 1-3. References to prior research studies are made along the way of the discussion to lend weight to the findings. In the conclusion for each theme, only the codes that were mentioned by more than 50% of Overall-Group are addressed in detail.

5.3.1 Research Question 1: “What are the Structure, Context, Culture that Enhance Innovation in Innovative and High-Performance Organizations?”

Regarding the antecedent factors of innovation, there were eight themes indicated by the participants, which consisted of: 1) structure, 2) system-process-tool, 3) staff, 4) human resource development and management, 5) leadership for innovation, 6) organizational climate and culture, 7) knowledge, and 8) environmental elements.

One of the recognized approaches of studies on innovation is to look at antecedent factors as: 1) individual employee characteristics; and 2) the work climate or work environment that the employee work in (Amabile, 1997; Amabile et al., 1996; Sternberg & Lubart, 1999). Considering from such approaches, the findings of this study are broadly in line with this stream of research, with seven themes related to the work climate or work environment. and some items in theme 3 (i.e. staff-related elements) corresponding to the concept of individual employee characteristics).

5.3.1.1 Theme 1: Structure

This theme refers to the structural elements that are found in the innovation related functions. Thirty meaningful expressions were analyzed from the interviews, which yielded three categories: 1) flat structure, 2) cross-functional project teams, and 3) internal spatial separation of structure.

1) Flat Structure

Flat structure is the structure in which there are very few hierarchical layers between the operating staff and the management. Nine out of the 15 companies in the study (60.0% of the participants) said they had flat structure for the innovation function. For example, Company 1-SB mentioned that R&D had a flat structure with BU head at the top, overseeing project teams which were managed by project leaders; and stated that all staff had direct access to the BU head anytime. While Company 2-DE said that owing to the new focus on innovative digital solutions in their business, most of the middle management were removed, resulting in flat organizational structure; and that even the BU head had to personally manage one project by himself.

This concept of flat structure is well supported by several scholars, such as, Daft (2015), Smith et al. (2017) who indicate a flat structure as an organizational structure suitable for innovation activities, owing to its decentralization and low formalization (Daft, 2015; Subramanian & Nilakanta, 1996).

2) Cross-Functional Project Teams

A cross-functional project team is a team comprising members from different functions in the organization.

Eleven out of the fifteen companies (73.3% of the participants) said they used cross-functional project teams for their innovation projects, citing better collaboration and all-round expertise of the teams. For example, Company 1-SA stated that innovation project team members were composed of Planning Division, Factory, Marketing etc., whose diverse expertise were necessary for the success of projects. Similarly, Company 3-LL indicated that when they had a new project coming up, the project leader would form a team, choosing the members from various functional departments. And once the project was finished the project team was disbanded. Likewise, Company 2-DE mentioned that new innovative services to clients were jointly scrutinized and executed with all parties concerned to deliver the best possible results.

These findings are consistent with various scholars who specified cross-functional project teams as an antecedent factor for successful innovation. For example, Lester (1998, p.37) specifies that “cross-functional teams are ideally suited for new-product development assignments”; Rothwell (1992) indicates involvement of all departments in the project from its earliest stages as a critical factor for successful industrial innovation; while Thamhain (1990) specifies team involvement, and experienced and qualified team members as critical success factors in technologically innovative team management.

3) Internal Spatial Separation of Structure

This refers to the setting up of a new separate business unit or department within the company to handle its innovation function. In this study, 11 companies (73.3% of the participants) said they had separated an innovation work unit to handle innovation. Especially, Companies 1-TA and 2-SL indicated they separated

the innovation function from the factory operations to handle radical product and process-technology development, leaving the incremental innovation activities with the existing factory operations.

A theoretical discussion has evolved around the question of whether and to what extent explorative and exploitative units should be separated. Due to the different mindsets, skill sets, and motivations required by the different departments, some suggested the units to be physically and culturally separated from one another, and each having its own incentive systems and managerial teams (O'Reilly III & Tushman, 2013). Benner and Tushman (2003), and Tushman & O'Reilly III (1996) suggest the structure for an innovation-driven function to be small, decentralized, with loose processes; in contrast to the larger and more centralized structure coupled with tight processes for an efficiency-driven function. These moves are exactly informed by Christensen (1998) who suggest total separation of explorative units from exploitative ones in order to pursue disruptive innovation without interference from the latter.

In sum, the findings for Theme 1 indicated that all (100%) big and medium sized manufacturers (Groups 1&2) separated the innovation function as an independent work unit to pursue innovation, while all (100%) IT/high-tech companies (Group-3) opted for cross-functional project teams as a potent source of production and innovation concurrently.

5.3.1.2 Theme 2: System-Process-Tool

System-process-tool refers to the systems, processes, tools and mechanisms employed in the innovation function.

The data for analysis were derived from the answers to the interview question, "How do you manage innovation in your organization?" The answers to the questions generated 17 meaningful expressions which were grouped into five codes. These codes were, in turn, grouped into two categories, namely, 1) mechanisms/tools for idea generation, and 2) mechanisms/means for motivation to innovate.

1) Mechanism/Tool for Idea Generation

This category refers to the mechanism/tool used in creative idea generation. It included specialized methodology/processes used in creativity enhancement. Three companies (20.0% of the participants) said they had one or more

of these processes in use in their organization, especially in the innovation related functions. For instance, Company 1-CA said they used Design Thinking as a tool in generating creative ideas, while Companies 1-CB said they had been using TRIZ in their innovation management, together with some other innovation management standards.

Design Thinking is a management tool used to address complex and open-ended challenges in modern-day companies (Dorst, 2011). In the same manner, TRIZ is a systematic methodology that enhances creativity for innovation and inventive problem solving (Ilevbare, Probert, & Phaal, 2013). The efficacy of these tools as such warrant their places in iHPOs as shown in the study findings.

The findings revealed that only big companies (Group-1) utilized tools for idea generation while Groups 2&3 did not have any such specialized tools in place. This could be interpreted that big organizations depended more on systematic creativity tools to help generate ideas and manage innovation.

2) Mechanism/Means for Motivation to Innovate

This category refers to the elements that motivate employees to participate in innovation. They can be processes, mechanism, business activities or any management means that ignite the motivation to participate in innovation in organizations. They included (1) innovation contest; (2) knowledge sharing sessions; (3) commercial success of the new products; and (4) rewards and recognition for innovation.

(1) Innovation Contest

Six companies (40.0% of the participants) cited innovation contests as the means for the motivation. For example, Company 1-CB claimed they used innovation contests as tools to motivate people to participate in innovation. Company 2-DE mentioned they were promoting innovation contest company-wide, giving out to the winner a financial award and a trip to an overseas trade exhibition.

The concept of using innovation contest as a means to motivate innovation is well supported by Boudreau, Lacetera and Lakhani (2011), who suggest that innovation contests are a historically important and increasingly popular mechanism for encouraging innovation.

(2) Knowledge Sharing Sessions

Two companies, 2-SL and 3-DI (13.3% of the participants), said they used knowledge sharing sessions as a means for motivation, claiming knowledge sharing is an effective activity which triggers a sense of achievement and motivation to the presenters.

The findings are informed by Kankanhalli, Tan, and Kwok-Kee (2005), who suggest that the one intrinsic motivation in sharing knowledge is altruism, or, in other words, the intrinsic enjoyment of helping others. This concept seems to be at play in all the illustrative cases of the study findings.

(3) Commercial Success of the New Products

The third mechanism/tool for motivation to innovate is the acknowledgement of commercial success of the new products. Two companies, 1-SB and 2-NN (13.3% of the participants), claimed commercial success of new products were sources of motivation for the innovation team because they all wanted to see their achievement in the products they innovated.

In 1961, a famous psychologist McClelland published a book titled *The Achieving Society*, which articulated his model of human motivation. McClelland contended that three dominant needs in human beings are the source of human motivation; needs for achievement is one of the three. This theory by McClelland explains perfectly the study findings that being informed of the success of one's innovation work is one of the tools to motivate people to innovate.

(4) Rewards and Recognition for Innovation

Rewards and recognition for innovation were also found to be a motivation tool for innovation. There were four companies (26.7% of the participants) confirming that rewards and recognition for innovation accomplishment were a source of the motivation. For example, Company 1-CB described that, at times, financial rewards for innovation efforts were a good tool in spreading the sentiment for innovation. Because people could speak proudly of how much reward they got for their innovations or improvement projects for the year. In this sense, the reward also doubled as a recognition for their achievement. By the same token, Company 1-SB indicated that researchers or people in innovation did not just crave for financial rewards, they wanted recognition for their achievement as well.

The concept of using rewards and recognition for innovation management is signified by Tidd and Bessant (2009), and Thamhain (1990) who point out that any attempt to build a creative climate and to manage innovation successfully must involve systematic development of various organizational elements including the reward and recognition systems. This is also consistent with Tesluk, Farr, and Klein's (1997) proposition that reward orientation is one of the aspects of organizational culture and climate that are likely to influence individual's creativity.

In conclusion, the findings for Theme 2 showed that big corporates had a preference for innovation contest and rewards and recognition as motivation tool for innovation.

5.3.1.3 Theme 3: Staff-Related Elements

This theme refers to the elements relating to staff, which are an antecedent of innovation in organizations.

In response to the interview question, "What are the factors related to the staff that enhance their innovativeness?", the interviewees gave the answers that yielded 76 meaningful expressions which were grouped into four categories, namely, 1) knowledge and skills, 2) attitudes for innovation, and 3) learning. Details of this theme are displayed as follows:

1) Knowledge and Skills

This category refers to the knowledge, competency, capability and skills in staff that are antecedents of innovativeness of the organization. It includes 4 codes as follows: (1) functional expertise; (2) ideational fluency; (3) flexibility and adaptability; and (4) good teamwork skills.

(1) Functional Expertise

Functional expertise refers to the knowledge and skills of employees in their respective job functions. As seen from the findings, 11 companies (73.3% of the participants) cited this element as existing and necessary in their innovation functions. For instance, Company 1-TA said they hired R&D staff with various expertise and backgrounds, and even hired foreign staff from overseas who possessed the expertise that they could not find locally. And Company 2-NN commented that their R&D staff were separated into 2-3 sections to concentrate on their

specialties. These examples underlined the fact that companies pursue innovation through the functional expertise of their personnel.

Supporting these findings are various theorists who indicated that domain-specific knowledge and skill of employees plays an important role in employee innovation. For example, Amabile (1988, p. 130) specifies “domain-relevant skills”, which include factual knowledge, technical skills and special talent in the specific domain of the business; Ford (1996, p. 1124) indicates “domain-related knowledge”; and lastly, Woodman et al. (1993, p. 296) mention “relevant knowledge”. The concept of domain-specific knowledge and skill were congruently specified in the findings of this study.

(2) Ideational Fluency

This category refers to creativity or the ability to generate creative ideas and think out of the box. Five companies (33.3% of the participants) gave concurring evidence that this was the quality in their innovation staff that contributed to innovation in their organizations. For example, Company 1-TA said creativity was a characteristic of their innovative people and teams. When one person introduced an innovative idea, the others would add more and more ideas to it, which would eventually shape the initial idea into a well-tuned and far more concrete practical idea than the initial one. Similarly, Company 2-NN mentioned their team members must initiate ideas that had at least 60-70% chance to succeed, not simply dreaming up fanciful ideas that had no chance of turning into reality; these practical ideas would then get batted around by the team until something really good took shape.

Ideational fluency in innovation staff is illustrated by Barron and Harrington (1981), and Westwood et al. (1993) as one antecedent factor enhancing innovation in organizations.

(3) Flexibility and Adaptability

This is the ability to adapt to changes in the task environment and to alter courses of action accordingly to achieve targets. Four companies (26.7% of the participants) mentioned this as a factor required for employees' innovativeness. For instance, Company 1-CB mentioned the adaptability of their product development team who developed a successful product for the Japanese market. The team later made adaptation to the product to fit the Thailand market and

launched it successfully. Company 1-TA also indicated this trait in their R&D team, explaining when the R&D people went to the factory, they would always ask why and what about the production lines; they were always thinking about ways to change and adapt here and there in the process to make it work better and faster. Another example by Company 2-UI indicated good R&D people had to be open-minded, ready to listen to differing opinions, and were quick at adopting new things or ideas; they had to be flexible in changing their course of action when there was an impasse in the extant method.

Lewin, Long, and Carroll (1999); and March (1991) are some of the scholars who associate adaptability with exploration, which includes all explorative activities in the pursuance for innovation.

(4) Good Teamwork Skills

This element refers to communication skill, and the ability to build interpersonal relationship conducive to collaboration; so as to sustain the milieu of good teamwork. There were five companies (33.3% of the participants) who cited the importance of this element in their innovation team atmosphere. For example, Company 2-SL stated that they nurtured relation building, because they believed any creative idea would materialize through cooperation of the team; and that creative people without good relationship with other team members could seldom get things done. In the same manner, Company 3-DI explained one of the qualities they looked for in a job applicant was the ability to fit in the team. The applicant had to demonstrate an ability to adapt to the present culture of work in the organization, he/she had to be able to mingle well with other people because teamwork was key to their innovation work.

This antecedent factor is well informed by several scholars; for example, Tidd and Bessant (2009) who stress the importance of effective team working as a component of innovative organizations; and Smith et al. (2017) who confirm intra-organizational collaboration to be an antecedent of innovation; and lastly, Hill et al. (2014) who indicate collaboration as one of the four basic shared values (i.e. bold ambition, collaboration, learning and responsibility) of innovative organizations.

2) Attitudes for Innovation

This category refers to the mental attitudes in employees that are necessary for pursuit of innovation as follows:

(1) Affection for Creating New Things

This refers to an employee's affection for innovating new products or work processes. Three companies (20.0% of the participants) cited this as the quality found in their innovation people. For example, Company 2-PR's Innovation Director stated his affection for invention of new products and thinking up new equipment for the production line was as an element that kept him motivated in his innovation work. And Company 2-NN said their R&D staff were enthusiastic in their work, and always enjoyed working on new innovation projects.

This trait is supported by Jolly's (2008) concept specifying the quality of being passionate and having faith in new product development as one of the elements that sustained innovative culture in organizations.

(2) Curiosity and Inquisitiveness

This refers to the employees' curiosity in things around them. It includes inquisitiveness, and eagerness to find out about things that interest them. Four companies (20.0% of the participants) stated curiosity in their staff was the trait that accounted for innovativeness. For example, Company 1-TA indicated their innovative people were always curious about what and why of things; they always asked why things were done the way they were, and suggested new ways of doing things, so on so forth. Company 2-NN mentioned the first trait they saw in their team members was the curiosity in things around them; they were not complacent with what existed but always wanted to improve or develop new things or new way of work.

The trait of curiosity is indicated by a number of scholars as a precursor for innovativeness in organizations, which entices individuals to observe things and people around them, so as to spot needs, dissatisfaction or frustration from customers and employees with the existing products, processes or service and bring forth new ideas and innovation accordingly (Costa & McCrae, 1992; Jolly, 2008).

(3) Open-Mindedness

Open-mindedness refers to the quality of being open to other people ideas, accepting and taking in the better ideas to replace their own. Three companies (20.0% of the participants) signified this trait. For example, Company 1-SB described their corporate values as including open-mindedness which called for employees to be open-minded, open to new ideas and new ways of doing things. Company 2-UI also described that the good R&D people had to be open-minded, ready to listen to differing opinions, and quick to adopt new things. Company 3-DI mentioned their project team leader as very open-minded; the leader would listen patiently to any opinions from team members, discussing and evaluating the opinions before accepting or rejecting them accordingly.

According to a number of scholars such as King, McKee, and Broyles (1996), and Patterson (2002), there is a positive relationship between creativity and openness to experience which included open-mindedness. Likewise, Rothwell (1992) mention dynamic and open-minded leaders as one of the success factors in industrial innovation management.

(4) Challenging the Status Quo

This refers to the characteristic that defies status quo and complacency. Three companies (20.0% of the participants) described this characteristic as an important quality in their innovation staff. For example, Companies 1-SB and 2-NN stated that innovation people had to think out of the box, not clinging to the traditional beliefs.

Jolly's notion (2008) supports the concept of challenging the status quo by suggesting that innovative organizations enhance ambition and challenge their employees to be outward looking and question the status quo.

(5) Achievement Orientation

This refers to the attitude of always striving for success, and persistence in achieving targets set out for them. Five companies (33.3% of the participants) raised this as a desired characteristic in their innovation staff. For example, Company 3-LL stressed that a good team member had to be action-oriented, persistent in achieving the target of his job, did not easily give up when encountering

problems but would instead find ways to work round the problems until solutions were derived.

These characteristics are supported by Amabile (1988), and Dacey and Lennon (2000) who indicate that sustained hard work, determination to succeed, and perseverance were the characteristics of a creative person.

(6) Taking Responsibility and Commitment to His Job

This code refers to being responsible and committed to one's job. This was demonstrated by six companies in the interviews (40.0% of the participants) who pointed out that responsibility and commitment in finishing one's job was highly required in their innovation project teams. For example, Company 2-NN indicated that the important quality required from innovative team members was taking responsibility for their initiative. If a person proposed any creative ideas, he/she had to assume responsibility in following through till it materialized. Likewise, Company 3-LL explained what they looked for was a person who took responsibility in his/her job and worked hard to get the job done well. And Company 3-IN indicated that a team member must be passionate and highly committed to his/her job, highly responsible in finishing the project as planned.

Responsibility is quoted by Hill et al. (2014) as one of the four basic shared values in innovation teams, namely, bold ambition, collaboration, learning, and responsibility.

3) Learning

This category illustrates three aspects of learning of innovation staff. It includes issues such as (1) affection for learning; (2) self-learning; (3) learning from mistakes; and (4) keeping pace with the latest technology.

(1) Affection for Learning

This concept indicates the liking for learning in order to enhance one's knowledge, skills and expertise. Six companies (40.0% of the participants) demonstrated the affection for learning as a requisite in their innovation people. For instance, Company 1-CB described their innovation people as having a voracious appetite for learning and experimenting their ideas; they were action-oriented. Similarly, Company 1-TA indicated that innovation people appeared to be always in the learning mode, and that they would search on the Internet to follow trends

of technology. When they go to the factory, they would always ask why and what about the production lines. Likewise, Company 3-JJ described their staff as not only capable, but also loved to learn, to search for knowledge. When others might be browsing the web for fun, they would search the web for academic papers to read.

Lock and Kirkpatrick (1995) and Tidd and Bessant (2009) suggest that learning is a way to enhance the utilization of skills and knowledge which could assist employees in generating new ideas. In similar fashion, Tohidi, Seyedaliakbar, and Mandegari (2012) point out that learning within the organization is associated with higher creativity. Consequentially, the affection of learning would likely increase skills and knowledge of the employees which would, in turn, generate more creativity.

(2) Self-Learning

This code means learning by oneself from various sources one can lay hands on.

Five companies (33.3% of the participants) pointed out self-learning as a quality found in their innovation team members. For instance, Company 2-UI stated self-learning was one of the imperative learning styles for R&D people; they were very capable in finding new knowledge on their own from various places and media. In the same manner, Company 2-DE described the CEO as acquiring knowledge of digital media and digital marketing from many years of self-learning and became one of the few experts in the field.

Banerjee and Kumar (2018) state that acquisition of knowledge are normally derived through external uncontrollable learning opportunities, and self-learning which was within oneself and well within one's control. In addition, Tohidi, Seyedaliakbar, and Mandegari (2012) suggest that learning within the organization is associated with higher creativity. Accordingly, it is well supported to infer that self-learning enhances creativity.

(3) Learning from Mistakes

Learning from mistakes refers to the lesson learned from one's mistakes on the job or from the innovation project. This is a valuable lesson gained from experience.

There were five companies (33.3% of the participants) who attached importance to lessons learned from past mistakes so as not to repeat them. For instance, Company 1-CB stated that they kept records of all projects whether they were a success or a failure. A failure could well serve as a lesson-learned for the future innovation project. Similarly, Company 2-PR indicated that if a team member came up with a good idea, the company would usually encourage the person to experiment on it. And if the experiment failed, no one would be blamed, and the failure could serve as a lesson learned.

This concept corresponds with that of Tushman and O'Reilly III's (1997) suggestion that creativity can be stimulated through a culture that accepts failures. Similarly, Pfeffer and Sutton (2000) also point out that organizations must encourage employees to generate new ideas by accepting failure and suggest organizations not to punish employees for failures arising from trying new things.

(4) Keeping Pace with the Latest Technology

This code refers to monitoring technology trends and updating one's knowledge and skills accordingly. This notion was rightly reflected by nine out of fifteen companies (60.0% of the participants) who indicated this as an antecedent factor for innovation in their organizations. For instance, Company 1-SB stipulated that in their industry, there were frequent disruptions, so they had to update the competency of the innovation team on a regular basis. They even sent the team members to attend training courses in institutes overseas to learn from top ranked professors of the field the latest technologies that had emerged. Similarly, Company 2-SL revealed they had just brought in the newest digital technology in the production processes in order to save time in setting up the machines. This minimized machine set-up time resulting in lower cost, which enabled them to be competitive in the market. Lastly, Company 3-JJ illustrated the importance of getting the latest knowledge and know-how in the IT industry by the fact that the company, from time to time, sent their

teams for study trips in Japan, Hongkong, and the US to get updated on the progress of technology.

Rothwell (1992, p. 233) signifies the establishment of “effective linkages with external sources of scientific and technological know-how” to get updated on the development of the field, as a critical factor for successful industrial innovation.

In conclusion, the findings for Theme 3 indicated that functional expertise was considered most relevant for innovation by 73.3% of the companies, especially by the IT/high-tech companies (Group-3) where 100% of the group signified this antecedent. This was obviously because Group-3 businesses were heavily knowledge-based. As for keeping pace with the latest technology, 100% of the IT/high-tech companies (Group-3) regarded it as a significant antecedent; while only 20% of Group-1 cited as their antecedent. This was owing to the nature of Group-3’s business which was entirely technology-based. Another antecedent specified as significant in 80% of Group-3 companies was taking responsibility and committed to his/her job. This again reflected the importance of individuals as part of the production and innovation process of the knowledge-based business; without responsible individuals who acted as a reliable production/innovation machine, the job could not get done effectively.

5.3.1.4 Theme 4: Human Resource Development and Management

This theme discusses the issues of learning and development and human resources management that enhance innovation in organizations.

The data for analysis were derived from the answers to the interview question, “How do you develop your staff for innovation?”. The content analysis of the answers yielded 15 meaningful expressions which were grouped into six codes. These codes were then grouped into two categories, namely, 1) learning and development, and 2) effective talent recruitment practices.

1) Learning and Development

This category covers the issues of training, education and staff development. Some scholars indicated that experience accounted for seventy percent of employee development and that the most learning occurred at work itself. (Morrison & Brantner 1992). Thus training, job rotation, and on-the-job training are the optimal

ways in enhancing skills and knowledge at work. In addition, Lock and Kirkpatrick (1995) and Tidd and Bessant (2009) argue that a combination of various learning methods could enhance the skills and knowledge contributing to idea generation.

The findings from this study produced five types of workplace learning, including (1) coaching; (2) job rotation; (3) technological competency development; (4) development of communication and socialization skills; and (5) development of creativity skills. The findings positively reflected the afore-mentioned scholars' propositions.

(1) Coaching

Coaching refers to one-on-one guiding, advising and teaching for someone to master his job.

There were three companies (20.0% of the participants) indicating this practice as the way they groomed their staff. Following are some illustrative cases in point. Company 1-SA said their staff were monitored closely by their bosses from both their functional department and project team. In close cooperation, they would take time to coach the employees by giving feedback on their performance. Similarly, Company 2-NN stated that in regard to staff development, they emphasized on-the-job-coaching, i.e. explaining how to do the job and coaching them how to solve the problems arising on the job. Lastly, Company 3-IN stressed the importance of coaching by reiterating that despite their big knowledge management system (where a server was dedicated for the storage of every piece of knowledge they had), face-to-face coaching for every staff was a tool in use in the actual knowledge transfer.

These findings are congruous with the concept indicating that coaching has been recognized as a learning and development tool in which managers and managerial leaders assume the developmental role of coaching to foster employee learning and development (Hamlin, Ellinger, & Beattie, 2006; Huang, & Hsieh, 2015).

(2) Job Rotation

Job rotation refers to a periodical lateral transfer of an employee between jobs within a company. Job rotation is frequently used as a means to develop employees, learn about their abilities as well as to motivate them.

Two companies (13.3% of the participants) indicated job rotation as an employee development means to expose the employee to diverse work experience and to gain various competencies and perspectives. Company 3-DI illustrated that they trained people to learn new skills by assigning them to try out new role that they were not well-acquainted with. But they did this only when not in a rush to finish the project. While Company 1-SB stressed the effect of exposing employees to both explorative and exploitative aspects of business by job rotations. They revealed that having quite a number of R&D staff, they allocated some to focus on long term innovation, and some to focus on creating new product features to build up short-term sales volume. By rotating the staff between those two functions they could acquaint them with the fact that the business thrived on both creating sales for the short-term and creating new knowledge for the long term.

The findings are in accordance with Casad's (2012), and Kampkötter, Harbring, and Sliwka's (2018) proposition that those employees who have gone through job rotations achieve a higher performance in subsequent years. The latter scholars further explain that job rotation is beneficial because firstly, it speeds up employees' skill acquisition and helps them learn on the job; secondly, it gives motivation to employees as it keeps work interesting; and lastly, it gives insight to the employers about the different competencies their employees possess, which improves the match quality of employees to jobs.

(3) Technological Competency Development

This code refers to the development of technological competency in innovation staff to enhance their competency for their jobs.

Three companies (20.0% of the participants) illustrated the concepts by pointing to the needs and methods for technological competency development in their staff, as in the following. Company 1-SB elaborated that there were frequent disruptions in their industry, so they had to update competency of the innovative people on a regular basis. The company had them attend training courses in institutes overseas where there were top ranked professors of the field to learn the latest technologies. And sometimes they needed open innovation to utilize external expertise lacking internally. Likewise, Company 2-NN emphasized the updating of relevant knowledge by stating that they arranged various technical training for the staff

throughout the year to update their knowledge and skills. These might be in-house training by internal or external experts. And they also sent their staff for overseas training with the suppliers in Japan, or Italy. Similarly, Company 3-IN revealed that their staff got training in new technology from internal or external experts and they also send their staff for training in Japan with their business partners.

These findings are well supported by Amabile (1988) who proposes earlier that domain-relevant skills or expertise are the foundation of all creativity; the more skills the employees have the more innovative they could become. This notion substantiates the organizational efforts in the development of their employees' domain-specific competencies.

(4) Development of Communication and Interpersonal skills

This category refers to competency development in terms of communication. There are two companies (13.3% of the participants) who addressed the lack of communication skills in their innovation teams, as illustrated in the following. Company SB indicated their R&D staff were not good at communicating and socializing with other people especially those outside of their function. Therefore, they had to develop and embed these skills in the staff. One of the interventions was to send the employees to go visiting customers to practice socializing with outsiders. While Company 3-IN illustrated that what they found lacking in innovation people was communication and presentation skills. They did not seem to clearly and efficiently get across what in their mind to other people. And this was the area that they arranged training sessions for.

These findings are in tune with Rothwell (1992) who indicates the importance of communication for successful management of innovation; and with Thamhain (1990) who emphasizes that the lack of which could signal problems brewing in the project.

(5) Development of Creativity Skills

This category refers to training on idea generating tools to enhance creative idea generation. Two companies (13.3% of the participants) gave examples of such development activities for their staff, as shown in the following cases in point. For example, Company 1-CB described they had year-round training courses

on TRIZ, or other innovation and improvement tools, for example. Kaizen, Six Sigma etc. In like manner, Company 1-TA explained about their development of creativity skills that they held creativity workshop to support the employees to think and work better. Besides, the company arranged some other tools such as creativity contests to stimulate the employees' creativity on the topics of their choice.

Creativity skills is one of three major elements (i.e. expertise, creativity skills, and task motivation) that enhances creativity (Amabile, 1988). Therefore, development of creativity skills is rightfully deemed conducive to innovation in organizations.

2) Effective Talent Recruitment Practices

This category refers the issue of competency-based recruitment specifically the interview process. According to the findings by Jorgensen, Laugen, and Boer (2007), HRM positively affects innovative behavior and company performance, especially when companies align their continuous innovation activities with their strategic objectives, using systems, procedures, and processes to measure the results.

Two companies (13.3% of the participants) expressed their emphasis on the effective competency-based interview practice for the right choice of recruits for their innovation function. For example, Company 2-NN illustrated this point by saying that they emphasized innovation competency-based recruitment, looking for those innovation competencies during interviews. And Interviewee 3-GG indicated that he would spend a couple of hours interviewing a candidate. He did so out of the belief that just a couple of interview questions could not get an interviewer to know how capable an applicant was. During the process, he looked for real competencies the applicant possessed. In closing he would always ask the applicant to describe what loss the company would suffer by not hiring him/her. This proved a compelling question to get the applicant to show concretely what worth he/she had for the company. Interviewee 3-GG claimed that, as a result, eighty percent of the successful new recruits turned out to be capable and effectively contributed to their teams.

The findings for Theme 4 were rather insignificant with the average occurrence frequencies in the range of 13.3% - 20.0%. The highest frequency by group

was 40% in Group-1 for development of creativity and Group-3 for competency based recruitment. Low frequency aside, the findings can possibly be interpreted that Group-1 which were a group of big organizations displayed the need to maximize creativity from their huge staff. In contrast, Group-3 which had rather small staff needed to maximize the immediate output from every staff they hired.

5.3.1.5 Theme 5: Leadership for Innovation

Leadership refers to a leader's ability, mental model, attitude, skills, behaviors and actions that motivate, inspire and facilitate individual and collective efforts to achieve shared objectives. Management and leadership are at the center of this research study for it is considered one of the most significant antecedent factors of innovation. This is because of the belief that leaders play a critical role in encouraging and facilitating collective learning and creating the climate for innovation through their remarks and behaviors, while organizational leadership (or the management) have the authority to set up systems, structure or relevant programs to indirectly influence innovation (Kelley & Lee, 2010; Schein, 2010; Shalley & Gilson, 2004; Tidd & Bessant, 2009; Yukl, 2009). Apart from that, once contextual factors are installed, skillful leadership is required to maximize the benefits from the new ways of working (Anderson et al., 2014).

The data for analysis were derived from the answers to the interview question, "What are the leadership factors that enhance innovation in the organization?" The content analysis of the answers yielded 99 meaningful expressions which were grouped into 22 codes. The codes, in turn, yielded 10 categories as follows: 1) showing support for innovation, 2) emphasis on teamwork, 3) showing passion and/or involvement in innovation, 4) pragmatism, 5) risk-taking, 6) openness, 7) competencies, 8) cognitive ability, 9) transformational leadership, and 10) key facilitators for innovation. Details of the theme are displayed in the following.

1) Showing Support for Innovation

This category refers to the leadership or organizational support for innovation in the organization.

Seven out of the fifteen companies (46.7% of the participants) confirmed the relevancy of leadership or organizational support in enhancing innovation. For example, Company 1-TA indicated the importance of leadership's

support for innovation saying the CEO held town-hall meeting regularly. In the meeting, apart from presenting the corporate performance of the period, he would touch on the emphasis of the corporate strategy on innovation and sustainability. He would indicate the support from the company for innovation by the amount of the resources invested in the innovation center; how it would turn out new products, new process technologies; and emphasized the importance of these innovation for the future of the company. In the same vein, Company 2-UI described that the leaders had to demonstrate interest and support for innovation, because R&D was not just another run-of-the-mill department, it was one of the most significant functions in our business. And lastly, Company 3-IN raised an interesting incident to show how supportive the leadership were for innovation. The interviewee [the CEO] described that there was one staff who came up to him with an idea of remote monitoring of toilet room vacancy. He let him experiment on that idea using the company's facilities. The result turned out all right and he approved the innovative device and software to be installed on the toilet facilities for use in the company. This little concept and technology were later improved and even embedded in some of their new products.

These study findings are supported by Amabile et al. (1996), who propose the concept of climate for creativity including autonomy, sufficient resources, challenging work, non-impediment and specifically, organizational support. This is in agreement with other scholars who indicated that leader's or organizational support for innovation is an important factor that enhances innovation (Amabile, 1997; Anderson & West, 1998; Isaksen, 2017).

2) Emphasis on Teamwork

This category refers to leaders' nurturing trust, collaboration and teamwork. Six companies (40.0% of the participants) indicated the presence of this leadership activity in teams at all levels. For example, Company 3-LL said one of the responsibilities for project leaders was to create teamwork atmosphere for all members to collaborate well in order to complete a project efficiently and effectively. Likewise, Company 1-TA said leaders must build up the motivation for cross-functional collaboration because in any innovation project various expertise from different functions were required.

These findings concur with Thamhain (1990) who proposes the antecedent factors of successful innovation management, trust and team spirit is one of the antecedents. This apparently signifies leaders' effort to nurture trust, collaboration and teamwork in the organizations.

3) Showing Passion and/or Involvement in Innovation

This category refers to passion, enthusiasm, interest or involvement in innovation. Twelve out of the fifteen companies (80.0% of the participants) confirmed this trait in their leaders. For example, Company 3-DI described the CEO as an exceptionally passionate person of innovation; almost on a daily basis, he would talk about some new technology from somewhere, giving the big picture of how to incorporate the new technology in the future inventions, so on so forth. In the same way, Company 1-SA described good leaders as visionary, passionate in their vision and displayed enthusiasm in materializing the vision. Likewise, Company 1-CA pointed out that leaders of innovation must have vision as well as passion in his work; vision is about initiatives, while passion is about materialization of the vision.

Jolly (2008) attaches importance to this leader's characteristic saying management need to be passionate and have faith in new developments, even if there is no demonstrable track record or experience.

4) Pragmatism

This category is about thinking of or dealing with problems in a practical way, rather than by using theory or abstract principles. It involves two codes: (1) action orientation and result driven leadership; and (2) having evidence-based judgement.

(1) Action-Orientated

This refers to the preference for action to prove an idea or concept rather than debating about it. Two companies, 2-PR and 2-NN (13.3% of the participants) gave a good account in line with the concept as in the following.

The interviewee from Company 2-PR who was Director of Innovation described himself as welcoming any good ideas from the team members and always set up budgets for experiment to prove the ideas. Similarly, Company 2-NN described R&D leaders as action-oriented and encouraging experimentation on any idea

because that was the only way to get the clear picture of what the idea was, and how it would probably turn out.

Several scholars confirmed that successful organizations learn through experience and refine their existing capabilities, at the same time they also create variety in experience through experimenting, innovating, and risk taking. (Levinthal & March, 1993; Lewin & Volberda, 1999; March, 1991). This reflects the significance of taking action and experimentation in organizations. With this objective in mind, it is only natural that the goal of a leader in an innovative organization is to encourage action-taking and experimentation of ideas.

(2) Having Evidence-Based Judgement

This code refers to a leader's decision making which is based on facts and figures, not on his own imagination.

Five companies (33.3% of the participants) indicated this trait in their leaders. For instance, Company 1-CA stated that leaders had to be on board, that is, they could not just make decisions from their office, they had to go out and see firsthand what was going on out there in the field. Similarly, Company 1-SB described that when they wanted to launch a new product, they would quickly come up with a prototype, and take it to their retailers to sound out their opinions. They would make adjustment to the prototype according to the information gathered from the customers, and iterated the process until they got everything right, before making the decision to proceed with the actual mass-production. Lastly, Company 3-IN pointed out that their project leaders were always in touch with the situation of the projects on hand. They made decisions based on the facts and data derived from the frontline of the projects.

These findings concur with Chiarini, Baccarani, and Mascherpa (2018) who illustrate that in making a decision, the leaders have to check for the facts themselves, so they can be assured they have the right information for making the right decision. The scholars made this conclusion from the concept of Toyota continuous improvement principle which requires decision makers to go to the actual places where things actually happen, to see for themselves the actual situations or the actual problems and the real causes, in order to gather the right information for the right decision-making.

5) Risk Orientation

This category refers to the orientation to take actions or make investments without knowing with certainty what the outcome would be. It includes (1) risk-taking; and (2) tolerance for failures.

(1) Risk-Taking

This code refers to the decision to take action without knowing for sure what the result will be. Five companies (33.3% of the participants) indicated this trait in their leadership. For example, Company 1-SA stated that the leaders knew that mistakes could occur at any points along the way, and that employees should be able to learn from the mistakes; they must be able to take risks, to implement ideas into action. And they did not simply judge things based on short-term results. Similarly, Company 3-LL concurred that a leader should be comfortable with risk owing to the nature of innovation projects that no one was able to tell exactly what the final outcome would be. Likewise, Interviewee 3-IN described that he [the CEO] once decided to invest in the new software project that he felt was risky because he was not sure if there would be market for the product. But he decided to invest and went ahead. Fortunately, he said, it turned out all right and the company was making profit from the sales of this new Cloud solution.

These findings are well supported by various scholars such as Amabile and associates. (1996), García-Granero and associates (2015), Isaksen (2017), and Rothwell (1992). These scholars cited risk taking as an antecedent factor conducive to creativity.

(2) Tolerance for Failures

This code refers to the ability to tolerate failures or mistakes that happen in innovation projects, or to not expect perfect result every time.

Three companies (20.0% of the participants) indicated this trait as essential to the management of innovation in their organizations. For instance, Company 1-TA said that the quality of an innovation leader was being comfortable with risk, and tolerant to a certain degree of loss, or failures, and not expecting perfect results all the times. The opinion was that without these traits innovation in the company would not have succeeded. Similarly, Company 2-NN signified this trait in the CEO, saying that the leader gave support for experimentation on new product ideas, he would

empower the R&D to make decisions on what new products to innovate. Even if R&D failed in any experiment, the CEO would not be upset or anything as long as he got to know that the team had tried their best. After all, he was fully aware that new products were the lifeline of the company's revenue stream, without experiments no new products could take shape.

This concept of tolerance for failures, displayed in the findings, is supported and illustrated as related to the risk orientation level that a person has (Amabile, 1997; Barron & Harrington, 1981; Patterson, 1999).

6) Openness

This category refers to welcoming, accepting new ideas or being receptive to any situations that arise in the work environment. It includes 2 codes, namely, (1) being accessible to team members; and (2) open-mindedness.

(1) Being Accessible to Team Members

This element refers to leaders being accessible to team members for discussion and advice.

There were five companies (33.3% of the participants) indicating leaders being accessible to their team members. For instance, Company 1-TA said the head of the innovation center was open and accessible for talks at all times. If anyone came to him with a question, he would always discuss with him/her. In like manner, Company 3-IN described leaders being accessible to the team as a necessary factor in running a project efficiently, especially when the team members needed immediate advice, suggestion or decision in regard to issues arising in the projects on hand.

The findings are in line with Rothwell (1992) who stresses establishment of internal and external communication as a critical factor for successful industrial innovation; while Thamhain (1990) indicates good communication as conducive to successful management of innovation project teams. Therefore, it stands to reason for a leader to grant followers easy access for instant discussion.

(2) Open-Mindedness

This code refers to openness of a leader to other people's ideas, especially ideas from his team members; and the willingness to try out and accept new possible ideas. Literally, open-mindedness refers to the quality of being open to other people ideas, accepting and taking in the better ideas to replace their own.

There were six companies (40.0% of the participants) identifying this quality in their leaders as a leadership trait that enhanced innovativeness in teams. For instance, Company 2-SL described the CEO as very open-minded and that he was the type to listen and encourage his team members to express ideas and take actions on the ideas. This leadership trait was rather important in making his team to dare to think, dare to express ideas and to suggest ways to do things or solve problems. Likewise, Interviewee 2-PR, who was a company's Director in charge of innovation, implied his open-mindedness in this episode by describing that, often, when he was at his wit's end as to how to proceed in a project, he would ask for opinions from his product development team members. In fact, the team members were not as highly educated as himself, but he found they could surprisingly suggest brilliant ideas that actually worked. By the same token, Company 3-GG mentioned that leaders in the company fostered the atmosphere of openness to ideas to motivate people to express their thoughts or voice their opinions or make suggestions, without fearing harsh outright rejections from their bosses; this was a great motivator for the software development teams.

The findings are supported by King, McKee, and Broyles (1996) and Patterson, (2002), who indicate that there is a positive relationship between creativity and open-mindedness. Similarly, Calantone, Cavusgil and Zhao, (2002) cite open-mindedness as one of the four components of organizational learning and that learning is positively correlated with innovation; thus, establishes the notion that open-mindedness is conducive to innovation. And because of the belief that leaders play a critical role in influencing the followers through the leader's remarks and behaviors; it is, therefore, important for this characteristic to be demonstrated by the leaders (Kelley & Lee, 2010; Schein, 2010; Shalley & Gilson, 2004; Tidd & Bessant, 2009; Yukl, 2009).

7) Competencies

This category refers to the competencies of leaders that positively effect innovativeness and motivation to innovate of the team members. It includes five codes: (1) being visionary and communicating the vision; (2) good networking; (3) adaptability and flexibility; and (4) empowering.

(1) Being Visionary and Communicating the Vision

This code refers to an ability to form a future vision of what the company should and could become and do to prosper and sustain, and the ability to articulate and communicate the vision to others clearly and effectively

Seven companies (46.7% of the participants) indicated the significance of this leadership competency; some quotations from the interviews give a clear account of the code. For instance, Company 1-CA cited that leaders for innovation must have vision as well as passion in his work. Vision was about initiatives, while passion was about turning the vision into reality. While Company 2-DE explained that the CEO was very visionary; he had a clear and right vision of what to become in the coming years, and he had been correct so far. His vision served as the directions for the team to follow.

The findings are supported by Brown and Eisenhardt (1995) who find that, for the best performance results, senior management should form a vision of objectives and communicate the vision to their teams while simultaneously giving team members the freedom to work autonomously within the scope of that vision.

(2) Good Networking

This code refers to the ability of leaders in creating business network in the industry and beyond.

There were four companies (26.7% of the participants) who identified this as an important competency in their leaders that enhanced the company's innovative capability. For instance, Company 1-CA said that after he came back from an innovation management course at MIT, he started a project in coordination with 10 organizations who jointly created an innovation award for the public. This was truly an open innovation project coordinated by his network of alliances. Consequently, the network evolved into a massive business network. From

this network, Company 1-CA were exposed to various innovations which were successfully commercialized for launches in their retailers. Similarly, Company 2-NN described the CEO as having good network in various industries. The CEO could always turn to this network for assistance in their R&D projects if so required. The case in point was when they encountered an impasse in a project, the CEO introduced R&D to someone from his network with the relevant expertise to help tackle the problem. One last example, Company 3-IN described the impact of having an international network on the company's capability. The interviewee explained that the founders of the company were Japan alumni and they also had Japanese IT companies as their shareholders and partners. In recent years they had established business connection with some western companies too. All these partners formed a global network keeping them updated on the technological developments worldwide.

The findings are supported by several scholars. For instance, Baer (2012) describes that good networking is a factor conducive to innovation. He indicates that the relation between creativity and implementation is regulated by individuals' motivation to put their ideas into practice and their ability to network, or, alternatively, the number of strong relationships they maintain. Likewise, Rothwell (1992) indicates to the same effect that effective linkages with external sources of scientific and technological know-how is a factor for successful industrial innovation management.

(3) Adaptability and Flexibility

This code refers to the ability to adapt to changes in the task environment and to alter courses of action accordingly to achieve targets.

Six companies (40.0% of the participants) mentioned this as a factor required for organizational innovativeness, and hence innovation. For instance, Company 1-CA explained that in establishing a new business in another country, they had to adapt to the local context, not simply executing the business there entirely based on the business model in Thailand; some changes needed to be made accordingly. Next, Company 2-UI indicated that when the R&D set up a timeline for a project, the management would agree and hold R&D responsible for the completion of the project. Anyhow, the management were always flexible and ready to change the timeline if the true situation demands so. Similarly, Company 3-LL described that

though there were five or six principles in managing a project, they all boiled down to one thing, that is, to learn and adapt along the way in an iterative manner so as to achieve the best possible result.

The findings concur with Daft (2015) and Rothwell (1992) who illustrate the importance of organization flexibility. Specifically, Rothwell indicates corporate flexibility and adaptability to change as a critical success factor for organizations to cope with the stiff competition in the market.

(4) Empowering

This code refers to decentralization or delegating authority to followers to make decision on their own.

Six companies (40.0% of the participants) emphasized empowering their innovation project teams to work and make decisions freely on their own as long as they contributed to the achievement required of them. For example, Company 1-SB described the practice in their company saying that the R&D people could make many decisions by themselves without resorting to the superiors; this not just sped up work process but also serve as leadership development. In another example, Company 2-SL mentioned the business development division head did not go deep into the day to day operations of project teams, but only oversaw the big picture, delegating full authority for product development project owners to act freely as long as they had the required objectives of their teams in mind. And in the last example, Company 3-JJ indicated that in the process of Agile methodology utilized in the company, every morning the product development team held a brief meeting to update the situation of one another. And new targets of the day were arranged and committed by each team member. With this process in use, the project leader could fully empower followers to improvise in how to do their jobs on their own.

The findings agree with various scholars who posited that empowering a work team is an imperative for successful innovation management. For example, Smith et al. (2017) point out that participative and empowering management style enhances innovativeness in organizations. In contrast, Burns and Stalker (1961) state that organic structures, which supports flexibility, are conducive to innovation and could be derived by decentralization and autonomy.

8) Cognitive Ability

This category refers to the knowledge, skills and ability of the leaders for innovation. It includes (1) having broad perspectives; and (2) awareness of the latest business trends.

(1) Having Broad Perspectives

This code refers to the ability of a leader to have a high-level view resulting in a broad view of the business or projects on hand.

Three companies (20.0% of the participants) indicated this quality as found in their innovation leaders. Following are some of the explanations. For instance, Company 1-CB explained that R&D people normally had in-depth expertise in their disciplines, often lacking the big picture perspectives, while management had a bird's eye view of various fields of knowledge, which was complementary to the expertise of the team members. Similarly, Company 1-SB explained that leaders did not necessarily had more in-depth knowledge than the followers because the field developed so quickly that the leaders might not be able to keep up with the details. However, it was required that they had a broad perspective enabling them to see the linkages between all elements of an innovation project and know the interaction between them.

The findings are in line with Katila and Ahuja (2002) who explain that leaders' wide search scope enriches the knowledge pool by adding distinctive new variations necessary to provide a sufficient number of choices to solve problems and increase the firm's new product offerings.

(2) Awareness of the Latest Business Trends

This is a quality of a leader in being dialed in to the latest business or technological trends.

Three companies (20.0% of the participants) stipulated this quality as required in their leaders. For instance, Company 2-DE described that their innovation strategy relied heavily on the digital media technology. As it was a fast-paced industry, it was imperative for the business leaders to keep abreast with the development of the digital media market. Likewise, Company 3-IN suggested that the technologist who did not closely heed the development of the outside world could miss

the opportunities to create new innovation by combining what they already know inside the company and what was new from the outside.

This concept is signified by Rothwell (1992) who indicates the effective linkages with external sources of scientific and technological know-how for update on the development in the field as a critical factor for successful industrial innovation.

9) Transformational Leadership

This category refers to the leadership that is effective in transforming organizations through changes. Transformational leadership was considered a key determinant of organizational innovation by Howell and Higgins (1990). According to Hater and Bass (1988, p. 695), “The dynamics of transformational leadership involve strong personal identification with the leader, joining in a shared vision of the future, or going beyond the self-interest exchange of rewards for compliance”. Transformational leaders can inspire the motivation of their followers, increase awareness and acceptance of a shared purpose and mission, and inspire them to go beyond their self-interests for the good of the group (Bass & Riggio, 2006; Chen, Sharma, Zhan, & Liu, 2019; Wang, Kim, & Lee, 2016).

There are four codes comprising transformational leadership, such as (1) inspirational motivation, being visionary; (2) challenging followers intellectually, (3) individualized consideration for followers; and (4) influencing and persuasion.

(1) Inspirational Motivation/being Visionary

This code of inspirational motivation refers to one trait of transformational leadership indicating the leader being visionary and being able to convey the vision to team members to inspire them to move towards the vision.

Six companies (40.0% of the participants) showed that this was a trait found in their innovation leaders. For instance, Company 3-GG said that the innovation leader had to be able to look into the future and form a vision of what the future should be, and what directions to proceed. To be able to form a sensible vision, a leader had to be connected to various sources of information internally and externally. Similarly, Company 3-IN indicated that from his standpoint of having worked with leaders, he found that being visionary was the most important quality in the innovation

leaders. Leaders had to be able to shape the future and articulate what the future looked like to his teams to inspire them to march together toward the vision. Lastly, Company 1-TA briefly specified that leaders had to be visionary; vision and innovation should go hand in hand.

The findings are in keeping with a concept by a number of scholars who concurred that inspirational motivation is a transformational leadership trait, pointing to a leader being visionary and conveying the vision to his/her team members in order to inspire them to strive towards the vision (Bass & Riggio, 2006; Chen, Sharma, Zhan, & Liu, 2019; Wang, Kim, & Lee, 2016).

(2) Challenging Followers Intellectually

This refers to a transformation leadership trait that stretches follower's knowledge and skills beyond current level.

There was one company (6.7% of the participants) who clearly cited this as his normal practice. Interviewee 3-JJ, CEO of the company, mentioned himself as always motivating team members cognitively by giving them new challenges to whet their enthusiasm, experimentation and learning. The team would form a working group to work on the challenging idea; this gave them another perspective to look at the work.

This code agrees with various scholars who signified a leader's ability to stretch his followers intellectually, to challenge them to reach new heights of their intellectual ability (Bass & Riggio, 2006; Chen, Sharma, Zhan, & Liu, 2019; Wang, Kim, & Lee, 2016). For example, Bass and Riggio (2006, p. 7) indicate that transformational leaders "stimulate their followers' efforts to be innovative and creative by questioning assumptions, reframing problems, and approaching old situations in new ways".

(3) Individualized Consideration for Followers

This code is about leaders paying attention to their team members as individuals and customize their approach to each of them accordingly for the best performance from each one (Bass & Riggio, 2006; Chen, Sharma, Zhan, & Liu, 2019; Wang, Kim, & Lee, 2016).

One company (6.7% of the participants) clearly indicated this as a trait found in their innovation leaders. Company 2-NN said the team leaders

knew each of their team members well. They knew their capability and assigned projects to each member accordingly.

The findings are explicitly supported by Bass and Riggio (2006, p. 7) who indicate, “Transformational leaders pay special attention to each individual follower’s needs for achievement and growth by acting as a coach or mentor. Followers and colleagues are developed to successively higher levels of potential”. Individualized consideration is to be practiced when there are new learning opportunities springing up.

(4) Influencing and Persuasion

This code refers to the quality of a leader in getting followers to do their work not by giving orders but by influencing with reasons and logics, facts and figures, and role-model behaviors. (Bass & Riggio, 2006; Chen, Sharma, Zhan, & Liu, 2019; Wang, Kim, & Lee, 2016).

One company, 2-NN, (6.7% of the participants) gave a good account for this innovation leadership quality mentioning that as a middle management in between the top management and the working staff, when corporate directions were cascaded down to the team, the leaders had to be able to influence team members and stir their interest in the project to get them to buy in and commit to the tasks.

The findings are in line with Bass and Riggio (2006, p. 6) who summarize this leadership trait as behaving in ways that “allow them to serve as role models for their followers. ... Followers identify with the leaders and want to emulate them; leaders are endowed by their followers as having extraordinary capabilities, persistence, and determination.”

10) Key Facilitators for Innovation

This category refers to some key roles in facilitating innovation efforts which includes: (1) innovation champion, (2) boundary spanning function, and (3) gatekeeper function. These roles are not necessarily those of a leader but can be executed by anyone who has the potential to influence others. These were the role indicated by Daft (2015) and Rothwell (1992) as a factor leading to successful implementation of an innovation projects.

(1) Innovation Champion

An innovation champion refers to a person who supports an idea, project, or product, and endeavors to push the idea through any resistance; this person is also referred to as an idea champion.

There were four companies (26.7% of the participants) specifying this role in their organizations. For instance, Company 1-CB said the company encouraged innovation at all ranks across the organization, however, they were selective in grooming innovation champions. Business Units would select high-potential people, and the organization would groom them by putting them through various training and development, such as TRIZ training. The training was held every eight months. During the training, the champions were assigned homework, examination and a real project to finish within six months. In contrast, Company DE said because the way business was done totally changed, the new innovative business and work process could not be entrusted to the original employees. So, the company formed a new innovation department and recruited new head to lead the unit as an innovation champion and implementor, who, in turn, recruited new staff with the expertise on new digital platforms to join the new team. By the same token, Company 2-SL plainly described that the staff took care of their routine jobs and at the same time were also involved in development project, acting as a champion supporting the new project.

This role of an innovation champion is evidently signified by Rothwell (1992) and Schon (1963); they indicate that an innovation champion is a person who fully supports an idea, project, or product, and puts efforts to force the idea through resistance and will evangelize it throughout the organization.

(2) Boundary Spanning Function

This code refers to the task of getting in touch and communicating with external players.

There were two companies (13.3% of the participants) specifying this role in their organizations. For instance, Company 1-CB explained someone who would otherwise be referred to as boundary spanning role. The company said that some innovations in the organization were adopted across from other business units. They normally did not know what the other units were doing. It was the

innovation management role to facilitate the flow of information, the coordination and the adoption between units. Similarly, Company 2-SL described this person in the company as project owners who would act as a coordinator and communicating with all concerned parties.

This concept of a boundary spanning role was supported by Rothwell (1992, p. 225) who emphasizes the importance of effective internal and external communication and that “organisational integration via inter-functional product teams clearly is conducive to stimulating effective internal information flows.”

(3) Gatekeeper Function

A gatekeeper is a retriever and disseminator of technological knowledge and information for an innovation team (Allen, 1986; Rothwell, 1992).

Two companies (13.3% of the participants) indicated this as a significant role in their organizations. Company 1-SB said that Tech Management function monitor technological trends that are up and coming and may turn into megatrend, and they feed the knowledge into the innovation team. Similarly, Company 2-DE mentioned a ‘learning champ’ who updated information of the development in digital media which will keep the team abreast of the trends of the market and the progress on the customers and the customer accounts.

This key facilitator for innovation is signified by Rothwell (1992, p. 225) who indicates, “Within the R&D system itself research, mainly in the United States, has identified the ‘key individual’ who plays a crucial role in scientific and technological information retrieval and dissemination. He has been termed the technological gatekeeper.”

In summary, the findings for Theme 5 revealed that showing passion and/or involvement in innovation was highly regarded as an antecedent of innovation by all groups of company, with Group-3 showing the highest frequency at 100%. This showed the significance of leaders’ passion and involvement in innovation in IT/high-tech companies. Next was 80% in Group-1 which indicated that the staff in big corporations that emphasized new product innovation looked to their leaders for confirmation per se via the leaders’ attitudes and behavior toward innovation. The antecedent worth discussing was awareness of the latest business trends. This was

quoted by Group-3 with 80% frequency in contrast to 0% by Group-1, and 20% by Group-2. The findings could be interpreted that the changes in business trends for IT/high-tech industry were fast paced that required close monitoring for clues to alter their product offerings according to the trends; this contrasted with the apparent slow pace of change in industrial manufacturing industry.

5.3.1.6 Theme 6: Climate and Culture for Innovation

Climate refers to the shared perceptions among workforce members regarding organizational policies, practices, and procedures as well as the behaviors that are rewarded, supported, and expected at work, whereas Culture refers to shared values, norms, or underlying beliefs of the customary ways things are done in organizations (Anderson & West 1998; Ehrhart, Schneider, & Macey, 2013; Schein, 2010). Climate differs from culture in that it is more observable, and more easily managed, changed or improved (Tidd & Bessant, 2009).

The data for analysis were derived from the answers to the interview question, “What are the climate and culture factors that enhance innovation in your organization?” The content analysis of the answers yielded 65 meaningful expressions which were grouped into 13 codes. The codes, in turn, yielded eight categories as follows: 1) psychological safety, 2) diversity, 3) organizational support, 4) collaborative atmosphere, 5) experiment orientation, and 6) corporate strategy and shared value.

1) Psychological Safety

This refers to the atmosphere that enhances a freedom to express ideas, and debates.

Six companies (40.0% of the participants) stated they have such atmosphere in their organizations. Company 1-TA best described the concept saying that the atmosphere in the company was very open and allowed staff to debate ideas and voice their opinions freely.

This element of psychological safety is supported by Burningham and West (1995), and Anderson and West (1998). They signify it as one of the four factors of team climate that positively influence innovation, namely, psychological safety, vision, organizational support for innovation and task excellence for quality.

2) Diversity

This refers to the inclusion of personnel with varying functions in project teams.

There were three companies (20.0% of the participants) indicating this climate in their organizations. For example, Company 1-TA described that the innovation center comprised staff with various background and expertise and various nationalities who complemented each other nicely in the innovation teams. Similarly, Company 2-NN illustrated that the most important thing was their human capital. The R&D team members were from different disciplines, and different work background; it filled the gaps that might otherwise emerge.

Extant literature has shown that diversity is conducive to innovation because a variety of ideas can be generated as the result of the diversity (Martin, 2014; Williams & O'Reilly III, 1998; Woodman et al., 1996).

3) Organizational Support

This category refers to the support for innovation demonstrated by the management and company leaders. The organizations can show support in the forms of resources or opportunities.

There were 13 companies (86.7% of the participants) indicating this climate in their organizations. For instance, Company 1-SA indicated that one of the important factors was the organizational support in terms of opportunities, budget, etc. This was the factor leading to innovation in the organizations. In similar fashion, Company 1-CB mentioned that in order to be able to proceed with any innovation initiatives, despite the agreement among all people in the value-chain operations, consent and support from the top was still needed. Without the consent, the projects would not take place. Likewise, Company 2-DE indicated that when there was a good innovation idea coming up, the management would grant financial support for it, even if the clients were not going to pay for it. By the same token, Company 3-GG indicated that they gave full support in terms of equipment and facility for any new ideas that the team members wanted to experiment.

This concept has been suggested by Amabile (1997), Burningham and West (1995); Isaksen (2017); and Rothwell (1992), indicating that

organizational support is one of the antecedent factors contributing to innovation in organizations.

4) Collaborative Atmosphere

This category refers to the organizational climate that enhances collaboration in innovative organizations.

Eight codes are classified in this category: (1) breaking down silos (2) good co-ordination between functions, (3) frequent meetings, (4) organization wide participation, (5) showing trust in followers, (6) helping out other members, (7) friendly atmosphere, relaxed atmosphere, (8) open space and modern looking work surrounding.

(1) Breaking down Silos

This code refers to minimizing obstacles that hamper collaboration among related departments.

Three companies (20.0% of the participants) described their efforts in reducing silo effects in their organizations. Company 1-CB explained that when they first embarked on the new journey towards being an innovative organization, they started off, first and foremost by tearing down the silos built up in disparate departments over the years. It took time and efforts to get rid of the walls. Likewise, Company 2-DE described that with the introduction of the new business model, they got rid of the silo working style. Now in every project, all parties concerned were called in to participate from the beginning of the project, so as to get everyone on the same page from beginning to end. The new practice created alignment both physically and mentally. Similarly, Company 3-JJ illustrated that they enhanced collaboration by having as few functional departments as possible. The practice reduced silo effects and increased collaboration among departments.

This antecedent is supported by several scholars, such as Hill et al. (2014), Smith et al. (2017), and Tidd and Bessant (2009), who stress the significance of collaboration, and, thus, signify the importance of clearing the path for smooth collaboration.

(2) Good Co-Ordination between Functions

This code refers to the cooperation in achieving a task among the parties concerned.

There were 7 companies (46.7% of the participants) giving evidence of the climate in their organizations. For example, Company 2-SL described the inclusion of various parties in an innovation effort by explaining that when someone came up with a good idea for innovation, they would brainstorm on the idea among different functions e.g. Production, Sales etc., to see how it would work out. In the final stage, Accounting/Finance would be included to formulate a costing model to present to the management. Likewise, Company 1-CB said that whenever necessary they would pull Marketing department in to help scale up an innovation owned by an independent regional branch office. Because the innovation may be launched successfully in one small territory, but to launch it nation-wide required more in-depth marketing expertise. Furthermore Company 2-DE added in a somewhat different but relevant view to the findings, saying that in creating collaboration, the big issue to solve was the flow of information in a project. This was somewhat solved by having as many project members as possible to visit customers together, in order to keep everyone in the loop about the on-going situation. However, it was impossible to have all members to visit customers together at all times, so they further solved this issue by installing an interactive digital platform to update the information among the whole team so all can always access the project information. Lastly, Company 3-GG stressed that in order to gain cross-functional cooperation, they would try to have their people build good relationship with people in other departments, to share information, knowledge and to get help in solving problems.

These findings are in line with Rothwell (1992) who indicates that effective functional integration and garnering involvement from all parties concerned throughout a project are imperative in managing a successful innovation project. Furthermore, Thamhain (1990) specifies team involvement as a critical success factor in technological innovation team management.

(3) Frequent Meetings

This code refers to the meetings of all forms that are frequently held by project teams to update on the progress and situation.

There were two companies (13.3% of the participants) describing this climate in their organizations. For instance, Company 1-SB described that there were frequent small group meetings of the project teams, where they discussed the progress, the problems encountered and the probable solutions. They met several times a month, or sometimes more than once a week. They even met immediately after getting results of experiments. Likewise, Company 3-DI mentioned their business partner in Japan recommended they followed the Japanese routine of daily short meeting of project teams. They did and the result was satisfactory. Because through the meetings they got to know what was happening on a daily basis and could adjust themselves accordingly and timely. In the meetings they could also share insight promptly if there were any important issues cropping up.

The findings are well supported by Rothwell (1992), Thamhain (1990), and Tidd and Bessant (2009), who all agree that good communication is an antecedent factor in innovation management. And generally, a meeting is a medium of communication to update team members on the situation of a project.

(4) Organization-Wide Participation

This refers to the practice of encouraging participation in innovation from all levels in organization, not limiting innovation to only the innovation function.

Three companies (20.0% of the participants) specified this culture in their organizations. For instance, Company 1-CB indicated that a culture that enhanced innovation in terms of continuous improvement was imperative in the organization. And that was the reason the company pulled everyone in to participate. Normally, people would make all excuses that innovation was someone else's job such as, the Engineering's or the R&D's job, not theirs, and they would just sit back and not participate in innovation. Therefore, it was necessary to build the participative culture in innovation across the organization. Similarly, Company 3-GG explained that R&D department was the one to create new things. However, other non-R&D could also

contribute to innovation, at least they could think up improvement in their own work process, or they could even add in ideas that could contribute to the product innovation. Lastly, Company 3-LL indicated that the company motivated everyone across organization, not only people directly concerned with innovation projects, to contribute to new innovation. Because, after all, the people from outside the innovation circle were users of the company's products as well, so they were able to see things or details that the project teams may overlook.

The findings are in full agreement with Rothwell (1992) and Tidd and Bessant (2009) who point to high involvement in innovation organization-wide as antecedent to innovation.

(5) Showing Trust in Followers

This refers to leaders' trusting the ability of his team members and empowering them to carry out their assignments.

Four companies (26.7% of the participants) produced evidence of this climate in their organizations. For example, Company 1-TA mentioned that the innovation leader empowered his teams. When he assigned any project task, he would merely specify the expected end result, but trusted his team to figure out how to get there by themselves. Similarly, Company 3-DI mentioned leaders had to have trust in the followers and gave them freedom in doing their jobs.

This concept is supported by Isaksen (2017) and Thamhain (1990) who indicate that trust and openness is a positive antecedent of innovative teams; and is also in agreement with Khan, Breitenecker, Gustafsson, and Schwarz (2015) who posit that cognitive trust is the cornerstone of innovative team performance and to maximize efficiency, such teams rely on high cognitive trust and low task conflict.

(6) Helping out Other Members

This code shows the climate in which team members help each other in their tasks when so required.

Three companies (20.0% of the participants) stated they had this work climate among team members. First, Company 2-NN said that the R&D leaders from time to time deploy staff who had finished working on their own tasks to help other team members to finish the jobs. Likewise, company 3-GG said that when

any smart team member finished his work early, he must turn to help others in the team to get the project moving faster. Lastly, Company 3-IN explained that a good team member was a team-player, he would always help and cover for others when possible.

This concept was confirmed by Amabile et al. (1997) who posit that workgroup support is an antecedent factor in doing innovation work.

(7) Friendly Atmosphere

This refers to the workplace atmosphere that is friendly and informal.

There were four companies (26.7% of the participants) indicating this climate in their organizations. For example, Company 1-SB described the climate of in their workplace as very informal and brotherly across all levels. At the same time Company 2-NN also mentioned they kept the atmosphere in workplace as informal and friendly as possible. The team spent time working together in a brotherly and sisterly manner, having fun, making jokes and being playful to lessen the stress normally associated with R&D work. Similarly, Company 3-GG described the work atmosphere as very relaxing in terms of the workspace and the staff relationship.

These findings are supported by various scholars. For example, Isaksen (2017) mentions play and humor in the workplace contributes to creativity. And De Paoli and Ropo (2017) did an inductive study on the workspace features that are believed to contribute to creativity in the workplace; the findings include the features, such as, open offices, happy, playful communities of close-knit teams and spatial arrangements that resemble home, symbols and memories, sports, technology and nature. This stream of research study is still very limited, anyhow the extant literature points to the friendly climate, which coincides with what the participating companies had to say.

(8) Open Space and Modern Looking Work Surrounding

This refers to the physical workplace that is an open space where everyone on the same project sits together and more often than not it is designed in a modern looking style.

Three companies (20.0% of the participants) exhibited this open workspace in their organizations. For example, Company 1-TA illustrated that the innovation center was an open space, roomy, with modernized design. This work

environment was said to positively enhance the innovativeness. Also, Company 2-DE described that they were arranging open space to house every function involved in a project to sit and work together physically. This would create the effect of collaboration and information flow to keep everyone aligned.

This concept is in line with Isaksen (2017) who indicates that leaders could influence creativity by providing a stimulating physical work environment that supports creative thinking, such as: personalized offices, open collaborative work- space. And the afore-mentioned research by DePaoli and Ropo (2017) also supports this concept.

5) Experiment Orientation

This refers to the preference for experiments over mere discussion in order to prove a creative idea. This includes experiment orientation, and trial and error culture.

Six companies (40.0% of the participants) showed this orientation in their work climate and culture. For instance, Company 1-CB described that innovation was not just about knowledge or expertise but was about putting what one knew into action and learn along the path of the action taken. Similarly, Company 1-SB cited Learn-fast-and-fail-fast as how they approached innovation. When someone initiated some innovative idea, they would experiment on it right away. If it failed, then they would learn from it fast and tried some other ways until they found the good solutions. Likewise, Company 2-SL explained briefly that in proving an idea, they would put it to test or experiment on it to find the answer. By the same token, Company 2-UI described that R&D would always do experiments on an idea, buying raw materials to try out the concepts and iterating until the good result was achieved.

The findings are in agreement with Garvin (1993) and Hill et al. (2014) who indicate that leaders have to build an environment in which people are able to collaborate, experiment and learn through trial and error.

6) Corporate Strategy and Shared Value

This indicates a corporate strategy and corporate values focusing on innovation.

Eight companies (53.3% of the participants) indicated this element in their organizations. For example, Company 1-TA stated that innovation was

one of the five or six corporate values of the company, on top of collaboration, respect etc. Likewise, Company 2-UI explained that in the early days, when there was no proper innovation management in the company; there would be conflicts and non-alignment among departments, and innovation was not turned out as fast and smoothly as it should have been. Eventually the management gathered all parties concerned to sit at the same table, to acknowledge and commit to the same policy and strategies for innovation. And it was entrusted to all parties concerned as a common goal for all to help materialize speedy launch of every new product in every possible way. The practice enabled the company to launch new products at a faster speed than the competitors in the industry. Lastly, Company 3-LL described that it was one of the corporate strategies and objectives to offer new and better products, service or processes for their clients.

The importance of having a corporate strategy and shared vision is clearly illustrated by Raisch and Birkinshaw (2008). Additionally, Raisch, Probst and Tushman (2011, p. 331) opine that a shared vision leads to “the emergence of a strong superordinate identity shared by the whole project team, which created a sense of belonging and commitment to group objectives,” whereas Raisch and Birkinshaw suggest that decades of research signified the positive correlation between strategy and organizational activities. Therefore, it is right to the point when Rothwell (1992) indicates the importance for organizations to have a long-term corporate strategy emphasizing innovation as a key role of the organizations.

In summary, the findings for Theme 6 highlighted the relevancy of support for opportunities and resources across the board at 86.7%. The occurrence frequencies were even highest at 100% in Groups 1&3. Even the lowest frequency was at 60% in Group-2. This clearly signified the importance of organizational support as the potent antecedent of organizational innovation in all types of industry.

5.3.1.7 Theme 7: Knowledge

This theme refers to the knowledge in the organizations, which is deemed important in organizational innovation. The data for analysis were derived from the answers to the interview question, “From where does your organization get ideas for innovation and/or the innovations?” Upon the content analysis, forty-nine meaningful expressions were collected from the interviews, which yielded 11 codes

and, in turn, yielded two categories, namely, 1) sources of innovation, and 2) sources of knowledge.

1) Sources of Innovation

This category refers to the sources of innovation or innovation ideas that lead to the innovation of the organization. They can be from anywhere and in any form. There are three codes generated in this category: (1) ideas from people of all ranks, and (2) adoption of external innovation, and (3) joint innovation with external parties.

(1) Idea from People of All Ranks

This refers to the belief that everyone in organizations can contribute to organizational innovation, not limited to innovation people such as R&D, New Product Development, Engineering or the likes. Employees at all levels in the organizations possess seeds for innovation right at where they are.

Three companies (20.0% of the participants) stated they got their innovation ideas from people of all ranks. For example, Company 1-CB described in vivid details that they got innovation ideas from all levels of personnel. People at lower level of operations were involved in daily operation therefore their innovation projects were likely to be about improvement in operation processes. While management had a bird's eye view vision and so they were able to think up innovation ideas that were more radical in nature. Similarly, Company 3-IN revealed that leaders and the rank-and-filers served as sources of innovative ideas. However radical innovation ideas were almost always initiated from the top down. This might be because innovation leaders were at a higher altitude looking out with a wider perspective, and they possessed diverse knowledge base that enabled them to mix and match various technologies to form a new product concept. In contrast, the staff in the frontline were almost always the ones to initiate incremental innovation ideas—whether process improvement or product features improvement. This was owing to the fact that they were constantly encountering day to day operations and interfacing with customers, thus having more information in those regards.

The above findings are specifically in line with Amabile and Khaire (2008) who indicate that ideas for innovation could and should be tapped from employee at all levels in the organizations.

(2) Adoption of External Innovation

This code refers to the innovation adopted from outside the organizations.

Three companies (20.0% of the participants) disclosed they adopted innovation from external sources, local or overseas. The innovation could be new technology, new work process or new product or the components. For example, Company 1-CB said that they sometimes adopted new practices from outside the company, but they did not duplicate exactly the whole practices. Often, they utilized only 60-70%, and the rest were adapted to suit the organizational context. Another example, Company 2-SL said that in their industry western countries were leaders in the technology and know-how, so the company did not need to do the radical innovation themselves, but instead had to keep an eye on the latest development and adapt themselves and take in the new innovation as soon as possible. Lastly, Company 2-NN described that their know-how was originally from the Japanese business partner. But it turned out it could not be applied wholly to Thai raw materials, so they had to experiment and adapt the process until they got it right at a reasonable cost level.

The findings are firmly in line with Amabile and Khaire (2008), Rothwell (1992), and Thamhain (1990), who all agree that leaders must be able to take in external innovation or ideas, not just focusing on the internal sources.

(3) Joint Innovation with External Parties

Innovation can be jointly developed with external parties, especially the academic institute.

Five companies (33.3% of the participants) mentioned they had joint innovation projects with external parties. For instance, Company 1-SA explained that there were several sources for innovation, one of which was the external access to new technology. So, they cooperated with academic institutions by sponsoring and cooperating with professors to do research. From the research results, they would choose the technologies that could be used in their new innovation. Likewise, Company 1-TA mentioned that their innovation center worked jointly with university staff and utilized some of the institute expensive research facilities.

The findings are supported by the research positing that exploiting external sources of creativity and knowledge could increase organizational innovative capacity (Carlsson, Corvello, & Migliarese, 2009).

2) Sources of Knowledge

This category refers to the sources of knowledge that are important for innovation idea initiation. There are eight codes generated in this category such as (1) lesson learned from mistakes; (2) new knowledge gained from R&D; (3) searching for knowledge from the Internet, media, research papers; (4) learning and sharing session, (5) training or taking innovation courses; (6) learning from alliances; (7) external site visit; and (8) knowledge management system.

(1) Lesson Learned from Mistakes

This refers to knowledge gained from learning from reflection on past mistakes to derive insights and knowledge.

Three companies (20.0% of the participants) described this as a source of their valuable knowledge for innovation. For example, Company 1-CB disclosed that they kept records of all projects whether they were successful or not. They identified the cause of the failures which served as the lessons learned. Similarly, Company 2-UI indicated they had been doing R&D on their own for many years. In the early years, more than half of their attempts failed. Anyhow the failures served as the lessons learned which added to the body of knowledge. With the knowledge and know-how accumulated over the years, the company R&D achievement rate was much higher than before.

The concept is in accordance with Garvin (1993) who indicates the ability to reflect and learn from the past as an important element in building a learning organization which is specified by Calantone et al. (2002) as contributing to innovation in organizations.

(2) New Knowledge Gained from R&D

This refers to knowledge and learning created from companies' own R&D function.

Five companies (33.3% of the participants) cited R&D as one of their sources of knowledge for innovation. For instance, Company 1-SB described that apart from adoption of outside innovation, one important source of

knowledge was from the research within the organization; the company hired a lot of PhDs to do research internally. Similarly, Company 2-NN described that much of the body of knowledge accumulated in the company had been gained from their own experiment and research in R&D.

This concept is well supported by Cohen and Levinthal (1990) whose research reveals that R&D generates innovation and also facilitates learning.

(3) Searching for Knowledge from the Internet, media, and research papers

This refers to self-learning by searching the sources of knowledge which are available publicly for convenient search on the Internet or libraries.

Five companies (33.3% of the participants) said these were the sources of their routine search that offer valuable information. The quotations below give some details of the concept. For instance, Company 2-SL explained that they gathered market intelligence from external sources, seminars, and research articles, which contributed to insights of the market trend; while Company 2-PR indicated that their innovation ideas came mainly from trade exhibitions. And Company 3-GG also pointed out that apart from KM system in the organization, the Internet was another convenient source of knowledge for them. Lastly, Company 3-LL concurred that the Internet was a supplementary source of knowledge where they searched for information.

This concept is agreed by Banerjee and Kumar (2018) who state that acquisition of knowledge could be through external uncontrollable learning opportunities, and self-learning which was within oneself and well within one's control.

(4) Learning and Sharing Session

This refers to another source of knowledge from knowledge sharing sessions.

Four companies (26.7% of the participants) cited this as one of the sources to disseminate knowledge among employees. For instance, Company 3-IN talked about a little invention by one staff for use in remote monitoring of toilet vacancy in the office. After successful completion of the invention, the management

asked the person to share what and how he did on that little innovation to the other staff. The sharing session served as a good source of knowledge. Incidentally, after the implementation of the invention, the little technology was integrated into one of the company's new products. By the same token, Company 1-TA said the company held learning and sharing sessions for the production people. They would show video clips of new production technologies and brainstormed and share insights as to how to possibly utilize the technologies in the production process.

This concept is in line with Wang and Wang (2012) who propose that knowledge sharing practices facilitate innovation and performance. While explicit knowledge sharing positively affects innovation speed and financial performance, tacit knowledge sharing affects innovation quality and operational performance.

(5) Training or Taking Innovation Courses

This refers to the traditional way of learning by training or taking courses in innovation.

Eight companies (53.3% of the participants) stressed this as one of the knowledge sources for their employees. For instance, Company 1-CA indicated that one way they developed their staff to gain innovation management knowledge was to send them overseas to take innovation management courses at privileged institutes. Likewise, Company 2-NN said the company held various technical training throughout the year for the staff to update their knowledge and skills. Lastly, Company 3-IN disclosed their staff received training in new technology from internal experts and sometimes outside experts were hired to give workshops. Also, from time to time the company would send their staff for training in Japan with their business partners.

The findings concur with Morrison & Brantner (1992) who describe how training and some other development methods positively affect the employee's skills and knowledge for innovation.

(6) Learning from Alliances

This points to the source of knowledge from business alliances.

Six companies (40.0% of the participants) cited this as one of their sources of knowledge. For instance, Company 1-SA revealed they were cooperating with one of their alliances for a knowledge transfer. The alliance was from the same industry and was very advanced in its innovation idea generation method. The alliance was asked to be their advisor, to transfer the knowledge to their staff of how to generate innovation ideas effectively. Likewise, Company 2-NN described that they were having many open innovation projects with outside parties such as with suppliers or with academic institutes where they said they often learned something new. Lastly, Company 2-DE said that they were fortunate to have a business alliance in Japan to transfer media innovation ideas for use in Thailand. The Japanese alliance was said to have over 10 years' experience in the field ahead of the Thai company. Furthermore, this Thai company requested an experienced Japanese head from the alliance in Japan to head the media innovation team, and it worked out very satisfactorily.

As mentioned earlier on, it was posited that exploiting external sources of creativity and knowledge could increase organizational innovative capacity (Carlsson, Corvello, & Migliarese, 2009; Martín-de Castro, 2015).

(7) External Site Visit

This refers to the visit to external sites, mostly the business alliances, to gain insight into their operations which might benefit the visitors.

Two companies (13.3% of the participants) indicated this as a source for their knowledge. For instance, Company 1-CA said discovery of ideas could come from various sources, one of them was the external site visit. By the same token, Company 1-TA said from time to time they would arrange visits to other companies to see how they worked. The case in point was a visit to one of the alliances to observe how they arranged their office for the Agile teams and how they utilized technology in their work to enhance capabilities.

This is one way of learning from the alliances (as earlier mentioned) which enhances organizational innovative capabilities by observing

firsthand how these companies operate in the respective areas of one's interest (Carlsson, Corvello, & Migliarese, 2009; Martín-de Castro, 2015).

(8) Knowledge Management (KM) System

This refers to the knowledge database system available for search by internal staff.

Five companies (33.3% of the participants) specified the significance of KM for innovation. Company 1-CB illustrated this point by saying that when a project was selected for entry in the innovation contest, the project owners had to enter the full details of their project into the system. Despite the fact that these innovative people normally disliked documentation, at this point they were more than willing to deal with the detailed documentation because they felt the privilege of being a contest entry. These details actually contributed to the KM system available for searches by all relevant personnel in the organization. Company 1-SB indicated the significance of KM by saying the company had an advanced KM system with a dedicated server; all researchers had access to the knowledge database. Likewise, Company 3-JJ revealed that the company had a KM system that would automatically update the Kanban feature to notify everyone that a new file on a particular issue was entered into the system. This somehow facilitated convenient usage of the system. Lastly, Company 2-UI touched on the KM practices, saying that though intrinsic knowledge may be lost with each personnel if he or she left the company, the company tried to keep records of every experiment; the knowledge was retained well within the company, available for future reference when needed.

The findings on KM system are in tune with several scholars who cited KM systems as a source of knowledge enhancing innovation. For instance, López-Nicolás and Meroño-Cerdán (2011) show that both KM strategies of exploration (i.e., creation) and exploitation (i.e., storage, transfer, and application) impact innovation and organisational performance through an increase in innovation capability. Donate and de Pablo (2015) illustrate that innovation performance in knowledge-based firms hinges on both exploration and exploitation KM practices.

In summary, the findings for Theme 7 revealed rather low occurrence frequencies from 13.3% to 33.3% with two exceptions of 53.5% for training or taking innovation courses; and 40.0% for learning from alliance. As for training or taking

innovation courses, Group-3 scored as high as 80%, indicating the main sources of knowledge were from training and taking external courses. And for learning from alliance, again, Group-3 showed the highest percentage at 60%, which illustrated learning from alliance as one of their important sources of knowledge.

5.3.1.8 Theme 8: Environmental Elements

This theme refers to the elements in the work environment that serve as antecedents of organizational innovativeness. The data for analysis were derived from the answers to the interview question, “What are the elements that have an effect on innovation in your organization?” Twenty-seven meaningful expressions were derived that pointed to the elements in the environment. These yielded 6 codes that, in turn, resulted in two categories which are 1) customer orientation, and 2) external triggers for innovation.

1) Customer Orientation

This category indicates an organization’s focus on customers to gain the customer insight for developing the right innovation for the customers.

Nine companies (60.0% of the participants) stressed this factor as an external element that shed light on the directions for their new innovative products. For example, Company 2-SL said it helped their innovation to follow the market trend, to try to get the clear picture of how the market would develop in the future, what direction it was heading, what type of product would grow and how they could utilize their capabilities to address the market trend. Similarly, Company 2-NN indicated customer preferences, needs and insights gave them the directions for their new product development. Likewise, Company 2-DE explained that in the digital era, competitiveness lied in the research from big data of the consumer behavior in order to produce the innovation that captured the attention of the market. And lastly, Company 1-SA mentioned that they worked closely with B2B customers; the customers might have limitation in terms of R&D, lacking the necessary knowledge or the technological capacity. Working closely with the customer helped build up close relation and at the same time understand their product needs.

The findings are in line with Asif and de Vries (2015) and Rothwell (1992) who cite customer and market orientation, the emphasis on satisfying customer’s needs and efficient customer linkages, as critical success factor for

industrial innovation. By the same token, Wang, Zhao and Voss (2016). suggest that customer orientation have a strong total effect on innovativeness in service innovation and manufacturing innovation.

2) External Triggers for Innovation

This category indicates environmental factors that affect the decision to launch a new product development in organizations. It includes five elements as follows: (1) competition in the market, (2) short product life cycle, (3) laws and regulations, (4) social trends, and (5) technological changes.

(1) Competition in the Market

This refers to the competition posed by other companies in the market.

Three companies (20.0% of the participants) illustrated the effects of competition on their decision to launch an innovation project. For example, Company 1-CB indicated that competition was an important force for the company to keep on launching new products. Similarly, Company 2-NN described that they had to be innovative to launch new products so as to be the first to reach the customers because customers were always on the look-out for a new way to solve their problems; therefore, new product innovations would create good sales volume.

This concept is supported by various scholars who indicated positive relationship between competition in the market and the decision regarding innovation. For example, Steinmetz (2015) indicates that incentives to innovate are highest when competition is most intense. Similarly, Thamhain (2003) indicates competition as a factor influencing innovative performance; and Theeke (2016) indicates a positive effect of competition on a decision to develop a new product.

(2) Short Product Life Cycle

This indicates the shorter product life cycle than in the past, which keeps companies innovating for new products to replace old ones.

Two companies (13.3% of the participants) illustrated this concept in their interviews. For example, Company 1-CB said that in the past when there were few manufacturers, it was a seller's market then. Whatever were produced people had to buy because they did not have much choice. But now there were many manufacturers making the same category of products, the consumers could choose

whom to buy from. Thus, manufacturers had to compete to produce better products at a faster speed than the others. The competition shortened product life cycles and so companies had to be innovative and keep launching new products faster and better to be competitive in the market. Likewise, Company 2-SL mentioned that in the past, the product life cycle was 2-3 years, but now it sped up to mere 6 months. This shorter product life cycle forced the company to be speedier in the innovation process. The company even changed to digital technology so as to improve the process speed, to be able to cope with the quick changes in demand from the market.

This element is supported by a number of scholars. For example, Heirman and Clarysse (2007), Lynn (2008), Wang and Wang (2012) who posit that the increasing rate of competition, technological developments in the marketplace and shorter product life cycles pressure companies to innovate faster; or Calantone, Yeniyurt, Townsend, and Schmidt (2010, p. 349) who mention, “deciding when to launch new products is among the most significant issues facing managers when formulating new products strategy, especially for products with short product life cycles.”

(3) Laws and Regulations

This refers to the effect of laws and regulations on the attempts to come up with new innovation that addresses the laws and regulations governing the industry.

Two companies (13.3% of the participants) indicated this element as a trigger for launching innovation. For example, Company 1-CB said that Sustainability Development was an important agenda in the business world today. Environmental sustainability was a good concept, and making profits was also important in keeping the company alive. Therefore, the company needed to innovate in such a way that contributed to both aspects. Similarly, Company 1-SA described that in order to cope with the recent development in laws and regulations regarding environmental and Sustainable Development, the company had committed themselves to developing alternate energy. Recently they had innovated a unique solar cell system to produce electricity.

This concept is informed by Blind (2012, p. 391) who clearly states that “Regulatory framework conditions have been identified as important

factors influencing the innovation activities of companies, industries and whole economies.” Similarly, Thamhain (2003) specifies laws and regulations as the external factors that influence innovative performance.

(4) Social Trends

This element refers to the social trends that beget new preferences for products. This serves as a trigger for vigilant companies to produce new products to cope with social changes.

Two companies (13.3% of the participants) signified this element in their business of innovation. For example, Company 1-SB mentioned that ageing society was a present-day social phenomenon; the company was working on new components in the products that addressed elderly care—the sort of product that focused on everyday elderly safety. Similarly, Company 2-UI said that following the current trend of health consciousness in people young and old, the company had started a new line of business producing food supplements. They had developed quite a number of new products for this market segment which in a sense differed from the present business model.

The findings are in agreement with Ghazinoory, Abdi, and Azadegan-Mehr (2011) who suggest that when organizations do strategic planning, they must take political, economic, social, and technological factors into their analysis to derive a comprehensive strategic framework for the best competitiveness; this agrees with Thamhain (2003) who specifies social and political ambience as external factors influencing innovative performance in companies. Furthermore, Daft (2015) indicates customer responsiveness as a competitive advantage in organizations, which infers that customers who are external social members are one factor that influences decisions for new product development. This conclusion is consistent with Drucker (1985) who indicates that change in demographics is an opportunity for innovation.

(5) Technological Changes

This refers to the rapid changes in technology that affect the directions of innovation efforts in organizations.

Nine companies (60.0% of the participants) designated this element as an important trigger for their innovation efforts. This is illustrated in the following interview quotations from some of the companies. For instance, Company 1-

CB revealed that companies had to accept changes, because changes come with opportunities. Changes in technology brought about changes to human lifestyle and the way people consumed products or service. These changes had effects on the way the company developed new products to suit the changing lifestyle. Similarly, Company 1-SB explained that new innovation ideas could arise from the emerging technology or what they called tech-push innovation. Lastly, Company 2-DE summarized that the company had almost completely changed their product and service offerings to their clients than what they did just a couple of years ago. It was a right move in incorporating digital media technology into their service offerings. The interviewee mentioned that if the company had not embraced the change in technology, they would definitely be in trouble a few years down the road.

This element is in agreement with Heirman and Clarysse (2007), Lynn (2008), Wang and Wang (2012) who suggest that technological developments in the marketplace is one of the external factors that pressure companies to innovate faster. In fact, several prominent scholars have long indicated this external factor as a trigger for companies to innovate, such as Drucker (1985) who indicates new knowledge, especially the new technological changes as one of the opportunities for companies to innovate new products. By the same token, Thamhain (2003) also states that technology is one of the external factors influencing innovative performance of an organization.

In conclusion, the findings for Theme 8 revealed two codes of antecedent with 60% occurrence rates, i.e. customer insight and market intelligence, and technological changes. Particularly noteworthy is the latter, for which Group-3 showed 100% concurrence, which was highly obvious because the IT/high-tech industry heavily depended on technology, any technological changes, thus, naturally acted as a trigger for their innovation efforts.

5.3.2 Research Question 2: “What are the Paradoxes Encountered and Overcome in Achieving both Innovativeness and Efficiency (Ambidexterity)?”

This research question was to explore the paradoxes an organization faces in the course of managing to achieve both innovativeness and efficiency.

The concept of paradox was introduced as a framework to deal with the inherent complexity of organizational life by Cameron and Quinn (1988) and has received increased attention in the organizational theory literature as organizations become more complex, dynamic, and pluralistic (Clegg, Cunha, & Cunha, 2002; Poole & Van De Ven, 1989; Smith & Lewis, 2011).

There were rather low occurrences of meaningful expressions because the interviewees tended to think of paradox as a conflict or obstacle, not as “an idea involving two opposing thoughts or propositions which, however, contradictory, are equally necessary to convey a more imposing, illuminating, life-related or provocative insights into truth than either factor can muster in its own right” (Slaatte, 1968, p. 4). More than half of the case companies disagreed that they were paradoxes between innovation and efficiency, instead stressed that they are complementary to the degree that innovation enhanced efficiency in almost all aspects of their businesses. With the mis-interpretation of the actual intended meaning of paradox, some interviewees gave examples of the incidents in terms of problems, obstacles and conflicts, some even initially denied they had any paradoxes in their organizations. Anyhow with certain efforts 42 meaningful expressions were obtained from the interviewees, which covered six themes of paradoxes including 1) paradox of cross-functional collaboration vs. one’s own performance; 2) paradox of explorative vs. exploitative activities; 3) paradox of individual vs. team-based creativity; 4) paradox of change vs. continuity; 5) paradox of resource insufficiency; and 6) paradox of learning.

Though, there were rather low frequencies of occurrence of meaningful expression (i.e. 42 in total), each category was in itself of significance and worth discussing because it was all informed by various theorists.

However, since the frequencies of occurrence were in the very low range of 6.7% - 20.0%, conclusions for the themes could not be drawn with any significance, and thus were not presented in this discussion.

5.3.2.1 Theme 1: Paradox of Cross-Functional Collaboration vs. One's Own Performance

Cross-functional collaboration is an essential antecedent factor of innovation (Sundaramurthy & Lewis, 2003).

Nine meaningful expressions were extracted from the interviews which generated 1) paradox caused by lack of collaboration; and 2) solutions for the paradox.

1) Paradox Caused by Lack of Collaboration

As for the paradox caused by lack of collaboration, two companies claimed they had experienced this in the form of non-cooperation. Company 1-TA said that they did not get cooperation from the factory in providing a production line to test-run a newly developed product; while Company 1-CA claimed that there was a new innovation adopted for use by an external party, instead of being used by an internal business unit who was in the exact same industry. The interviewee claimed this stemmed from the needs to fulfill one's own responsible job, above all else.

This is supported by Smith and Lewis (2011), and Jarzabkowski and Sillince (2007), who cite that some paradoxes stem from the needs to fulfil plurality of goals from internal and external stakeholders. Often, a non-innovation department chooses to fulfil their job obligations instead of spending time and manpower to collaborate with an innovation project which may reduce the capacity to maximize its own department performance.

2) Solutions for the Paradox

From the interviews, several solutions to the paradox caused by lack of collaboration were described, such as (1) setting up KPI for collaboration; (2) utilizing integrated and cohesive cross-functional leadership teams; (3) alignment of relevant functions; (4) management calling for collaboration; and (5) enhancing communication and socialization among parties concerned

(1) Setting up KPI for Collaboration

This refers to including cross-functional collaboration as a KPI in the performance management system to signify the importance of inter-functional collaboration for innovation efforts in the organization.

One company, 1-TA (6.7% of the participants), indicated they used KPI in an attempt to increase awareness of inter-functional collaboration.

This practice is in line with the belief that performance management and innovation is positively correlated (Jeacle & Cater, 2012).

(2) Utilizing Integrated and Cohesive Cross-Functional Leadership Teams

This refers to cohesiveness and integration of an innovation leadership team which comprises members from different functions.

One company, 1-CB (6.7% of the participants) cited the effectiveness of this solution in the organization.

This was apparently a sound technique to employ because several theorists agreed that a cohesive team frequently resolves conflict and problem, and increases information sharing among members of the team (Brown & Eisenhardt, 1995; Ford, 1996; King & Anderson, 1990). Being a member of a cohesive innovation leadership team while also belonging to their own departments, this group of people are in a good position to bridge any gap that occurs in the innovation endeavor.

(3) Alignment of relevant functions

This refers to the alignment of the value chain and other support functions in the companies, for collaboration among the relevant departments.

Three companies (20.0% of the participants) specified this alignment as one of their management tactics for collaboration. Since each department has its own objectives and performance targets, the collaboration with other departments only bring about additional requirements on their job, which causes paradox of performance demands. Therefore, managing the alignment of relevant functions to enhance collaboration facilitates the smooth operation of innovation programs in a company (Rothwell, 1992). Company 2-UI illustrated the concept by saying the production process was rather fixed and the R&D people were all aware of that. They knew what the production line could or could not do, so they took care not to design any new products that required drastic changes in the production processes.

(4) Management Calling for Collaboration

This refers to the intervention by the top management demanding collaboration from every party.

One company, 1-TA (6.7% of the participants), indicated the management demanded collaboration from departments for the innovation center.

This stands to reason, according to Alvesson and Kärreman (2001) who posit that being visible and high-status subjects, senior managers are in a strong position to influence how people develop ideas, solve problems, adapt frameworks, arrange priority of tasks on hand, and build relations and experiences of the group.

(5) Enhancing Communication and Socialization among Parties Concerned

One company, 1-TA (6.7% of the participants), specified this intervention from HR department as a solution to the collaboration issue. They indicated there was a chasm particularly between the innovation center and the factory. The HR felt communicating and familiarizing each other on the operations of the counterpart would help create a clearer picture of what the other was doing and help reduce the non-cooperative attitudes.

This notion is well supported by Rothwell (1992) and Thamhain (1990) who concur that communication is an essential factor contributing to the success of innovation projects.

5.3.2.2 Theme 2: Paradox of Explorative and Exploitative Demands

Exploitative demands lead to efficiency while explorative demands lead to innovation. Therefore, pursuing exploitation to the exclusion of exploration may enhance short term performance, but it could result in lack of new innovations and the inability to respond adequately to environmental changes. Vice versa, pursuing exploration without balancing exploitation facilitates renewal of organizational knowledge base but results in organizations getting trapped in endless cycles of search, over-investment in experimentation (Raisch & Birkinshaw, 2008; Tushman & Anderson, 1986). These are treated as the fundamental components of paradox in ambidexterity (Kang & Snell, 2009; Lavie & Rosenkopf, 2006; O'Reilly III & Tushman, 2013; Winter & Szulanski, 2001).

There were eight meaningful expressions derived from the interviews, which, in turn, revealed two categories of the paradoxes of innovation, namely, 1) paradox caused by cost control in innovation projects; and 2) paradox caused by demands for speed; together with two categories of solutions for the paradoxes, namely, 3) solutions to cost control; and 4) solutions for demands of speed.

1) Paradox Caused by Cost Control

This paradox refers to the activity of cost control in the context of innovation projects, which normally requires slack resources.

One company, 1-CB (6.7% of the participants), mentioned this paradox in their innovation personnel characteristics saying innovative people did not have a liking for cost control.

This paradox is confirmed by McCrae (1987), and Oldham and Cummings (1996) who posit that innovative people lack conscientiousness while conscientious people lack innovation.

2) Paradox Caused by Demands for Speedy Completion of Innovation Projects

Three companies (20.0% of the participants), indicated there were demands for speed in their innovation project. These demands created a paradox because speed is clearly an element of exploitative activities that enhances efficiency of execution, while innovation is an explorative activity which enhances search for novelty and requires freedom from time constraint (Amabile, 1997; March, 1991).

This concept was illustrated by Company 1-CB who explained that nowadays, size was not the advantage, but speed was. This was because the first one to the market would consume all the budget of the buyers, leaving no room for the buyers to buy later products even if it was better.

3) Solutions for Cost Control

One company, 1-CB (6.7% of the participants), described assigning cost-conscious persons to manage the cost control as their solution to the cost control issue. This is apparently a wise decision because it was posited that innovative people lack conscientiousness (McCrae, 1987).

4) Solutions for Demands for Speed

Two solutions to the issue of speed were specified as: (1) investment for abundant facilities, and (2) simplification of processes.

(1) Investment for Abundant Facility

Two companies, 3-UI and 3-JJ (13.3% of the participants), cited they invested profusely in equipment and facility for their staff efficiently without queueing for a turn to use a particular equipment; this helped speed up their innovation

work. This concept is informed by Amabile (1997), and Asif (2017) who indicate that innovation needs slack resources.

(2) Simplification of Processes

One company, 1-CB (6.7% of the participants), specified simplification of processes as a solution to the demands for speed in an innovation project.

This finding is supported by a general concept in lean management where simplifying process could reduce waste of time, thus increase speed of the process (Arnheiter & Maleyeff, 2005).

5.3.2.3 Theme 3: Paradox of Individual vs. Team Creativity

This theme refers to the tension of focus on individual vs. team collaboration. Seven meaningful expressions were extracted from the interviews generating two categories: 1) paradox caused by lack of interpersonal skills, and 2) the solutions to the paradox.

1) Paradox Caused by Lack of Interpersonal Skills

Lack of interpersonal skills was referred to by the interviewees as lack of communication skill, relationship building, socialization, and was cited as an obstacle to interaction with other team members. This might consequentially hamper the collaboration from other team members in the brainstorming of an individual's initiative idea and, thus, poses a paradox of individual vs. team creativity.

Two companies (13.3% of the participants) cited this as an obstacle that caused a paradox of the focus on individuals vs. the focus on teams. Company 2-NN described their R&D people tended to behave like a lone scientist keeping busy to himself/herself and were not communicative with other people outside of their function. This posed a problem to gaining collaboration from other parties, which was necessary in realizing an innovation. Similar, Company 1-SB also mentioned the R&D staff were not good at communicating and socializing with other people especially those outside of their function. Therefore, the company needed to develop and embed these skills in the staff.

This paradox is informed by Hill et al. (2014) as an issue for leaders to tackle.

2) Solutions to the Paradox of Individual vs. Team-Based Creativity

The suggested solutions did not directly address the issue of lack of interpersonal skills but emphasized on the perspective of managing for both individual and team collective creativity.

Five meaningful expressions suggested two solutions, namely, (1) team brainstorming on an individual's initiative ideas; and (2) team efforts in idea implementation.

(1) Team Brainstorming on an Individual's Imitative Ideas

This solution attaches importance to both individual's and the team's creativity. Two companies, 2-NN and 2-DE (13.3% of the participants), cited managing for both elements by encouraging individual and team collaboration in brainstorming on ideas put forth by individuals in the teams. Hassan (2018) puts forth an idea that brainstorming is considered one of the easiest and most popular techniques to generate concepts and ideas, especially in tasks that require creativity. Furthermore, Korde and Paulus (2017), suggest that the most effective brainstorming process is one that involves a variation in individual and group ideation. This notion fits in perfectly as a solution to the paradox of individual and group creativity focus.

(2) Team Efforts in Idea Implementation

This refers to the materialization of an innovative idea into the final tangible products with the cooperation of the whole team because innovation is deemed a team effort (Amabile & Khair, 2008).

Three companies suggested this as their practice in dealing with an individual's creative idea. For example, Company 2-SL described they nurtured relation building, because they believed any creative idea would materialize through cooperation of the team; and indicated creative people without good relationship with other team members could seldom get things done. Similarly, Company 2-NN said innovation required collaboration from many parties, interaction with other people was a necessary requisite in getting the job done smoothly. Therefore, it was imperative for innovation people to be friendly and have good interpersonal skills.

This practice is well informed by several scholars; for example, Tidd and Bessant (2009) who signify effective team working as a component of innovative organizations; and Smith et al. (2017) who confirm intra-organizational collaboration to be an antecedent of innovation; and lastly, Hill et al. (2014) who identify collaboration as one of the four basic shared values (i.e. bold ambition, collaboration, learning and responsibility) of innovative organizations.

5.3.2.4 Theme 4: Paradox of Change and Continuity

This theme discussed the paradox of accepting and adapting to changes as opposed to remaining steadfast and sticking to the status quo. Six companies expressed their ideas on 1) paradox caused by resistance to change; 2) solutions to resistance to change.

1) Paradox Caused by Resistance to Change

This category refers to the paradox caused by resistance to change among exploitative functions.

Three companies (20.0% of the participants) indicated they encountered the resistance to change. For example, Company 1-SA indicated the company was a well-established company with a long-year history and reputation to protect; any radical innovation that might fail in the market would tarnish the reputation of the company. Therefore, there was a tendency to resist radical change in that regard. That resulted in a hindrance to the development of new products that were deemed too radical. Another example was from Company 2-SL. The company had many employees who were long-timers working in the company since the early days of the company. These people were used to the old way of work. So, whenever the company tried to introduce new process of work, there would be many employees who were reluctant to change. Lastly, Company 2-DE indicated that the staff there were happy with the way they had worked before the new business model and innovation solutions were introduced in the organization. They showed resistance to the change because they felt the change added unnecessary burden to their work.

These afore-mentioned accounts clearly illustrated resistance to change that resulted in the paradox of change and continuity. Various scholars explained that resistance to change emerges from a tendency to stick to the tried-and-true methods of work, which ensures existing work performance (Fosfuri & Rønde,

2009). Since innovation always involves changes (Cummings & O'Connell, 1978), resistance to change thus hampers innovation; and consequentially poses a paradox for the management to solve.

2) Solutions to Resistance to Change

This solution included the practice of involving people and exposing them to innovation.

There were three companies (20.0% of the participants) indicating different solutions in coping with the resistance to change. For example, Company 1-TA explained that they solved the mindset issue by exposing the people to the outside world to acquaint them with how the industry had changed. So that when the innovation center introduced new process innovation to the production line, they would be more prepared for the changes, and showed less resistance to the changes. Another company, 2-DE, described that they set new KPIs for non-innovation function, e.g. sales team, to promote company's new innovative solutions to existing customers to acquaint and force the staff to accept the new innovative way of work. And lastly, Company 2-SL emphasized that whenever there was a change in the way of work, clear directions to the effect from the top management must be given and the company had to be persistent in pursuing the change until it materialized.

Evans (1999) indicates that encouraging a creative tension between opposing forces such as a short- and long-term focus, differentiation and integration, external and internal orientation, and continuity and change is a way to balance the paradoxes of ambidexterity. This concept aptly supported the findings in this category.

5.3.2.5 Theme 5: Paradox from Resource Insufficiency

This refers to the paradoxes of the allocation of resources in terms of tangible and intangible resources that affects innovation. Six meaningful expressions gave rise to three categories of the paradoxes: 1) paradox caused by insufficient resources, 2) paradox caused by time pressure, and 3) paradox caused by workload pressure; and one meaningful expression explaining the fourth category: solutions to the paradox from resource insufficiency.

1) Paradox Caused by Insufficient Resources

This category refers limitation of budget which causes the paradox of sufficiency and insufficiency of the resources allotted for innovation efforts. This was illustrated by Company 2-NN who identified that limited resource caused an obstacle to innovation. Without sufficient budget for equipment and facilities, it was very difficult to get the project completed speedily and smoothly.

Studies revealed that innovation needs support in terms of resources (Amabile et al. 1996; Thamhain, 1990). The limitation of budget thus poses difficulty to the management of innovation. This is clearly illustrated in the findings.

2) Paradox Caused by Time Pressure

This category refers to the pressure for early project delivery. This pressure is an obstacle that creates a paradox between timeline and innovation, because innovation does not come about by force but by granting time for idea incubation (Amabile et al., 1996; Isaksen, 2017).

Two companies (13.3% of the participants) described this as a challenge in managing innovation projects. For example, Company 1-TA described that one of the obstacles in their innovation work was the demand from other functions expecting early result an innovation project, they were often pressured by other's claim that a big investment was made on this innovation facility and so it should produce good return on investment any time soon. That's the pressure on us that stifled creativity and innovativeness. Likewise, Company 2-NN claimed that the obstacle to innovation was time pressure; they claimed innovation needed creativity and creativity needed idea time.

The findings illustrate how time pressure negatively affected creativity and innovation.

3) Paradox Caused by Workload Pressure

This category refers to heavy workload that works against innovation and causes the paradox of heavy workload pressure vs. innovation. Again, over-workload reduces idea time that is required for creativity (Isaksen, 2017), consequently created a paradox in innovation management.

Two companies (13.3% of the participants) reflected on the negative effect caused by heavy workload, and manpower shortage on the

innovativeness of team members. For example, Company 1-TA described that one of the challenges was the workload of some staff. Because of the over-burden from routine jobs, they did not have enough time to think of development and improvements in the work process. Similarly, Company 2-NN said that over-workload was also another obstacle in their innovation management. It was caused by the limited manpower; every staff had to juggle several projects at the same time, which slowed down each project the person handled.

The findings laid out here clearly illustrated the negative effects between heavy workload and idea time that is necessary for creativity generation (Isaksen, 2017)

4) Solutions for the Paradox of Resource Allocation

One company, 2-NN, suggested reshuffling of manpower as a solution to address the obstacle from the resource pressures. The interviewee indicated deploying staff to finish their primary task that only they can do and then shift them to help their colleagues do the jobs that can be done by anyone.

The paradoxes caused by afore-mentioned insufficiencies of various resources, i.e. time, budget, or manpower, basically boiled down to one dominant paradox, that is, the paradox of efficiency vs. innovation. Both elements of the paradox are critical for corporate competitive advantage (Daft, 2015), and therefore must be well managed to maximize both short- and long-term organizational performances.

5.3.2.6 Theme 6: Paradox of Learning

This paradox refers to that of explorative and exploitative learning. Paradoxes of learning emerge when there are changes, renewal and innovation occurring in the dynamic systems (Smith & Lewis, 2011). These paradoxes involve exploiting existing knowledge and creating new knowledge in place of the old one (O'Reilly III & Tushman, 2008).

Eight meaningful expressions were extracted from the interviews, generating two categories: 1) paradox caused by lack of knowledge and know-how; and 2) solutions to the obstacle, namely, (1) job rotation; (2) hiring new competency; and (3) separation of functional expertise role and big picture perspective role.

1) Paradox Caused by Lack of Knowledge and Know-How

The obstacle caused by lack of knowledge and know-how could lead to the paradox of learning where companies had to vacillate between learning new knowledge and refining existing knowledge (O'Reilly III & Tushman, 2008).

One company, 2-NN (6.7% of the participants), cited this as one of the obstacles in managing innovation project especially when it involved very new technology that the staff never learned of or knew of before.

The remark from Interviewee 2-NN displayed the cause of the paradox of learning which dictates companies to manage for new knowledge creation and refining existing knowledge (O'Reilly III & Tushman, 2008).

2) Solutions to the Paradox of Learning

Seven companies (46.7% of the participants) specified three practices they employed as solutions to the paradoxes of learning. These include (1) job rotation; (2) hiring new competency; (3) separation between functional expertise role and big picture perspectives role.

(1) Job Rotation

This method was employed as a means to expose employees to both the explorative and exploitative knowledge. Morrison and Brantner (1992) cite job rotation, and on-the-job training as the optimal ways in enhancing skills and knowledge at work. This was illustrated by Company 1-SB (6.7% of the participants) who stressed the use of this method in acquainting the staff to both types of exploitative and explorative knowledge and functions in the company.

(2) Hiring New Competency

In filling the gap of knowledge lacking in organizations, one commonly employed method is to recruit new people with the new competency required of the job. Accordingly, to Sanchez, Heene, and Thomas (1996), successful firms have the capability of maintaining a mix of competence-leveraging and competence-building activities. Three companies (20.0% of the participants) stated they hired new staff to bring in new competencies. For example, Company 2-DE said they created new competencies for the new digital technology business by hiring an experienced department head from Japan who had over 10 years of expertise in the field. And after joining the company, the new head started hiring new team members

to man the new digital based innovation unit. Likewise, Company 2-SL said that in filling the competencies gap, the company launched a policy to recruit new staff with the competency and job experience that they did not have, even if it meant paying more. Lastly, Company 1-TA described that when the company planned to build the new innovation center, the management recruited the BU head from outside. This person had a long experience in the R&D of our field. He was entrusted with the task of setting up the whole facility and recruited the team members from various places both local and overseas.

The above findings gave a clear picture of how the companies solved the paradox of learning through hiring new competencies lacking in the organizations.

(3) Separation of Functional Expertise Role and Big Picture Perspective role

This refers to the separation of explorative and exploitative learning to the management and frontline level. This is confirmed by Katila and Ahuja (2002) who separate knowledge search level into search depth and search scope. Search depth or learning for functional expertise is associated with the operational staff, while search scope or width of knowledge is associated with the leadership.

This concept was indicated by three companies (20.0% of the participants). For example, Company 1-CB described that R&D staff normally had in-depth expertise in their disciplines, often lacking the big picture perspectives, while the management had a bird's eye view of various fields of knowledge, which was complementary to the expertise of R&D team members. Similarly, company 1-SB indicated that even though it was a nice thing for leaders to have field-specific expertise, it was not necessary for leaders to have more in-depth knowledge than the followers because the field developed quickly, so quickly that the persons in a management position might not be able to keep up with the details. But, on the other hand, it was required that they had a broad perspective that enabled them to see the linkage between all elements of an innovation project and know the interaction between them, in order to manage the project efficiently. Lastly, Interviewee 3-JJ who was the company CEO said that he always had in his head clear overall pictures of all projects and could guide the teams to take optimal actions if any deviation seemed to hamper the project.

All the examples illustrated clearly the separation of explorative and exploitative learning between the operational and the management staff in line with Katila and Ahuja (2002) who separate knowledge search level into search depth and search scope.

5.3.3 Research Question 3: “How do these Organizations Manage for Ambidexterity (Innovation and Efficiency)?”

This research question was to explore the antecedent factors of ambidexterity in the innovative high-performance organizations (iHPOs). The main interview question asked in the interview was, “How do you manage for both innovation and efficiency simultaneously?”

The findings showed that almost all of the companies cited that they did not manage innovation and efficiency as paradoxes but treat efficiency as the governing factor of innovation management. The findings revealed that efficiency played a significant role in determining whether to implement innovation projects by evaluating up-front the feasibility of the projects. Once the innovation projects took place, whether product innovation or process innovation, efficiency in terms of resource utilization, milestones of the projects and the possible success or failure of the projects were to be closely monitored at every phase of the project implementation. And the companies were ready to terminate the projects if they showed no sign of progress or displayed inefficient use of resources.

Eighty-seven meaningful expressions emerged from the content analysis of the interviews. These meaningful expressions produced six main themes of the antecedent factors, namely, 1) separation and dynamics of structure, 2) strategic management, 3) systems, 4) project control procedures, 5) leadership, and 6) knowledge.

5.3.3.1 Theme 1: Separation and Dynamics of Structures

This theme refers to the separation and dynamics between efficiency-focused and innovation-focused structures of the companies in this study. The answers to the interview question yielded 13 meaningful expressions and two categories: 1) spatial separation, and 2) alignment of relevant functions

1) Spatial Separation

This category refers to the physical separation of the innovation work unit from other functions.

Eleven companies (73.3% of the participants) clearly indicated they had separate physical structure for the innovation function. For example, one company indicated setting up a new work unit to handle the new digital media solutions business; while another described setting up an external joint innovation center with an academic institute. Similarly, Company 2-DE mentioned that in order to cope with the digital media transformation, the company has seriously set up a separate function to offer new solutions to the clients. The head of this department was from Japan, who was well experienced in the field of digital media solutions. Likewise, Company 1-TA described that they set up research facility in a university campus. The research facility was focused on developing breakthrough products mainly for international market and also developing new production technology for use in their factories. Further, Company 3-IN explained that instead of creating a new start up, they set up a new business unit, much like a startup, to handle the business of creating this new product. And lastly, Company 2-NN indicated that the company clearly separated an R&D function as an independent department to execute various product developments in core product lines.

A theoretical discussion has evolved around the question of whether and to what extent explorative and exploitative units should be separated. Owing to the different mindsets, skill sets, and motivations required in the contrasting units, some suggest the units are physically and culturally separated from each other, and each having its own incentive systems and managerial teams (O'Reilly III & Tushman, 2004). Benner and Tushman (2003), and Tushman & O'Reilly III (1996) suggest the structure for an innovation-driven function to be a small, decentralized one, with loose processes in contrast to the larger, more centralized structure coupled with tight processes for an efficiency-driven function. Likewise, these findings are exactly informed by Christensen (1998) who suggests total separation of explorative units from exploitative ones in order to pursue disruptive innovation without interfering from the latter.

2) Alignment of Relevant Functions

This refers to the aligning of the explorative and exploitative functions of the value chain and supportive functions. This alignment enables the smooth and seamless execution of day-to-day operations and the innovation efforts from inception of ideas through to the commercialization stage.

Two companies (13.3% of the participants) described the alignment of relevant functions contributing to good collaboration and smooth operation of explorative and exploitative activities. For example, Company 1-CB mentioned they organized an annual strategic planning workshop to plan the alignment of all involved functions in order to execute the innovation strategy effectively and efficiently. Likewise, Company 2-UI gave an illustrative example, explaining that their production process was rather fixed and the R&D people all aware of that. They know what Production could or could not do, so they took care not to create any new products that required drastic changes in the production process. Similarly, Company 1-TA described strategic planning sessions where all departments gathered in a workshop to plan the alignment of their functions for the stated corporate strategies.

The findings are well illustrated by several scholars, who have posited that long-term success stems from balancing the alignment and adaptability (Gibson & Birkinshaw, 2004; Tiwana, Bharadwaj, & Sambamurthy, 2007; Tiwana, 2008). Adaptability refers to the capacity to reconfigure activities in the company/BU quickly to meet changing demands in the task environment; while alignment refers to coherence among all the patterns of activities in the BU in which they are working together toward the same goal. Adaptability is associated with exploration, whereas alignment is associated with exploitation (Lewin, Long, & Carroll, 1999; March, 1991). Hence, organizations that focus on only alignment risk trading flexibility for stability because they build organizational inertia, making it difficult to introduce changes in the face of environmental threats (Hannan & Freeman, 1977; Sorensen & Stuart, 2000); whereas organizations that focus on only adaptability without taking alignment into account risk creating organizational chaos (Huy, 2002; Levinthal & March, 1993; Sastry, 1997).

In summary, the findings for Theme 1 revealed one code of antecedent of ambidexterity, separating work unit for innovation, with very high overall frequency

at 73.3%. Besides, 100% of Groups 1&2 quoted this antecedent in their organizations, which illustrated the importance of separated independent work unit to pursue innovation in manufacturing context. However, this incident was scarce in IT/high-tech companies (Group-3), because these organization opted for a project team in producing and innovating product concurrently.

5.3.3.2 Theme 2: Strategic Management

This theme refers to the corporate strategic management. The findings indicated 22 meaningful expressions which resulted in three categories, namely, 1) strategy for innovation, 2) ambidextrous strategy 3) ambidextrous planning, and 4) scenario planning.

1) Strategy for Innovation

This category includes the role of a leader in setting directions for the innovation of the company and to incorporate it into the corporate strategy and core values. This served as a guiding principle to align the operations of the company. The strategy for innovation would delineate the scope of work and the directions to guide the whole troop to move in the same direction without going astray which would otherwise waste resources and time that negatively affect the efficiency of innovation projects.

Eight companies (53.3% of the participants) indicated strategic management as an antecedent factor for their performance and innovation. For example, Company 1-CA indicated that they had to know what objectives and end business result were expected from doing an innovation. Leaders had to provide directions for this. Similarly, Company 3-JJ mentioned that often he, as the CEO, was the one to shape the future of what innovation to pursue. This was because he had more insight than the young staff; young staff were not experienced enough to actually realize their ideas into something commercializable. Likewise, Company 1-TA indicated that it was important for the company to give the directions as to how the company should proceed in all of the innovation. Similarly, Company 2-NN explained that in capable teams, the management just gave them broad scope of the innovation project and let them operate freely on their own to achieve the objectives. Further, Company 3-GG described that leaders were the one who set directions for innovation project team to use as guideline in their activities. Lastly, Company 3-IN mentioned that normally when it came to make

a decision of what innovation to pursue, top management was the one to decide what directions to go.

A strategy for innovation is an antecedent in managing organizational ambidexterity. This is vividly illustrated in the following tenet. In 1991, March posited a framework concerning the inherent tradeoffs between exploration and exploitation. The opposing nature of these activities derives from several stylized facts about resource-allocation constraints, organizational inertia, and desirable organizational outcomes. First, organizations make conscious choices to support exploration or exploitation activities by making resource-allocation decisions, thereby facing trade-offs between the expected consequences of the activities. Some organizations trade off short term efficiency for long-term innovation by supporting the search for new knowledge and prospective opportunities instead of leveraging currently available knowledge to address immediate needs (March, 1991). Similarly, by allocating resources to refinement of existing technologies and the leveraging of existing competencies rather than to developing new skills and capabilities, some organizations achieve immediate reliability at the future risk of becoming obsolete (Holmqvist, 2003; Leonard-Barton, 1992). Therefore, an optimal strategy for innovation in high-performance organizations would effectively secure a focus for innovation amidst the conventional focus on efficiency traditional in high-performance organizations.

2) Ambidextrous Strategy

This category refers to the ambidextrous focus of corporate strategy on both innovation and performance efficiency.

Eleven companies (73.3% of the participants) reflected this ambidexterity focus in their strategy. For example, Company 1-CA described that every innovative organization wanted the same things. The leaders wanted new innovation, new products, new service that were a success, and at the same time they also cared for growth, profit, stock price, brand reputation, etc. Likewise, Company 2-DE indicated that the company set KPIs for the sales teams to introduce the new innovative solutions to existing customers. Though, they did not expect high success rate, rather focused on the frequency of such the offering to customers.

From the previously mentioned principle proposed by March (1991), and supported by others such as, Holmqvist, (2003), and Leonard-Barton, (1992), organizations must maintain strategies that emphasize both innovation and performance efficiency by allocating resources to the refinement of existing technologies and the leveraging of existing competencies, and to the development of new competencies new skills and capabilities, so as organizations could maximize both immediate reliability, and overcome the future risk of becoming obsolete. The findings from this study are in agreement with what ambidexterity scholars had to offer to business practitioners aiming at being iHPOs.

3) Ambidextrous Planning

This category refers to the strategic management practice of annual goal setting and planning to review the performance efficiency and innovation progress. This category might as well be grouped together with the previous category. However, this study wanted to distinguish the two aspects of strategic management in terms of the content of the strategies and the process of the strategic management, so it opted to split this issue into two categories as such.

Two companies (13.3% of the participants) described they had annual corporate strategic meeting for cross-functional information to be shared to formulate the strategy for innovation. For instance, Company 1-CB said in their annual corporate strategic meeting, all functions shared information which would be used to review and formulate corporate innovation strategies. Likewise, Company 1-TA explained that in their performance management system, Goal Setting sessions were included in the process. Specifically, at year-end, a planning workshop for top management was held to brainstorm for the vision and ideal targets together with the achievable targets; followed by another workshop for BU heads and the managers to cascade the corporate targets down in their respective business units and created action plans to achieve the target.

The findings are underlined by a couple of scholars. For example, Song, Im, Bij, and Song (2011), suggest that, firstly, more flexible strategic plans that enhance potential improvisation are needed in new product development management and secondly, abundant resource allocation for innovation would signal the high priority and importance that organizations attached to innovation efforts and

hence leads to higher motivation in innovation teams, resulting in creation of more new product development projects. The suggestion is in line with Judge and Blocker (2008) who indicate that key means by which an organization will become strategically ambidextrous is by cultivating organizational capacity for change, which is moderated by environmental uncertainty and organizational slack. These scholars emphasize creating antecedent factors of innovation in the context of efficiency-driven strategy, which indicates the necessity for ambidextrous strategic management. Lastly, the significance of the essential ambidextrous strategic management is best summarized by Harrell, O'Reilly III and Tushman (2007) who posit that ambidexterity would only become a dynamic capability if the firm's exploitation and exploration activities are strategically integrated. Strategic integration requires a common set of values, a shared vision, and an overarching governance process signifying both innovation and efficiency concurrently. The above arguments clearly point to the need for companies to attach importance to both innovation strategy and performance strategy to become iHPOs.

4) Scenario Planning

Scenario planning is a planning method that enables the simulation of what could happen or become in various hypothetical situation.

One company (6.7% of the participants) stressed the importance of thorough scenario planning for an innovation project so as to simulate what could go wrong and the prevention measures.

Company 1-CB (6.7% of the participants) raised this issue as an antecedent of innovation management, explaining it was logical, by all means, to think very thoroughly in the innovation planning stage so that all were well prepared to solve possible problems when they really occurred.

This opinion is supported by Enzmann, Beauchamp, and Norbash (2011), who describe that scenario planning is a planning method that creates stories about multiple likely potential futures on a given time horizon and maps the preferred plans to address the multiple described potential futures. This is contrasting with traditional strategic planning which typically consists of predicting the future at a single point in time horizon and mapping the preferred plans to address such a

simulation. In effect, scenario planning offers a complementary approach to traditional strategic planning.

In conclusion for Theme 2, the findings revealed the only one code of antecedent, focusing corporate strategy on innovation and efficiency, with high overall occurrence rate at 73.7%. Furthermore, 100% of Group-1 companies claimed this practice in their organization, which indicated that all big organizations in the study emphasized ambidextrous strategy in their operation.

5.3.3.3 Theme 3: Systems

This theme refers to the performance management systems employed in these iHPOs.

Five meaningful expressions from the content analysis accounted for two categories of systems: 1) innovation talent management system, and 2) performance management system.

1) Innovation Talent Management System

This category refers to the talent management system utilized in the development and retention of innovation talents.

Three companies (20.0% of the participants) indicated they had the talent management system of some sort to ensure talent presence in the companies. For instance, Company 1-CB indicated the grooming innovation champion program. Despite the company encouragement of innovation efforts at all levels, they were selective in choosing innovation champions. The process required BUs to nominate their high-potential people who would be groomed by going through various training and development; such as TRIZ training which was held every 8 months. During the period, they had to finish several homework assignments, take examinations and had a real project to finish within 6 months. The company stressed they selected only talents to go through this ordeal. Similarly, Company 1-TA said they had a performance appraisal for talents, which was carried out every 6 months. Lastly, Company 2-DE indicated the company granted BU heads the authority to have the authority to promote talent so as to retain them with the company. The interviewee claimed that in one case, for example, one of the top team members was offered a better package from the competitor; he bypassed all the formal HR procedures and matched the offer to finally keep the person with the company. Furthermore, the talent

management system created programs for talent learning and development to empower these talents to keep their motivation high.

The findings are in line with Marin-Garcia, Aznar-Mas, and Gonzalez-Ladrón-de-Guevara (2011) who suggest that companies need to become innovative; and in order to do so, have to manage their talents well, and the scholars proposed a number of talent development programs to accommodate the needs of various job types in the innovation processes.

2) Performance Management System

This refers to performance management system used to manage the performance of all staff across organization.

Three companies (20.0% of the participants) indicated the use of comprehensive performance management system across all departments. For example, Company 1-TA explained that the company assigned various KPIs in various functions, such as: productivity per head, sale per head, net profit, tonnage (of raw material) per head or percentage of cost saving, reduction in expenses etc. When the management gave directions as to either increase or decrease these KPIs, each department would then have to think up better ways to process their work to reach the targets set out for them. Similarly, Company 3-GG described that the company set KPIs to manage performance of all staff including those in the solutions development function. Lastly, Company 1-SA described that the company based their performance management system on a matrix structure, in a cross-functional environment, where an employee's performance was evaluated by his functional boss as well as by his project boss.

The findings clearly illustrate some of the performance management system practices in these iHPOs. and are in agreement with Demartini and Mella's (2014, p. e1) proposition. The scholars propose that "performance management systems affected managers' perception of satisfaction, the effectiveness of the control system and the performance are related to process innovation." Furthermore, Zhou, Hong, and Liu (2013) confirm a positive correlation between performance management systems and firm innovation and performance. The findings and the scholars all point to the deployment of performance management system in organizations that aim at becoming iHPOs.

In summary, the findings for Theme 3 revealed very low frequencies of overall occurrence at 20% which were too low to draw any conclusions on the pattern.

5.3.3.4 Theme 4: Project Control Procedures

This theme discusses the importance of managing for efficiency in innovation efforts, which illustrates the management of paradoxical elements of innovativeness and performance control. The data for analysis were derived from the answers to the interview question, “How do you manage for efficiency against the backdrop of innovativeness?”

Thirty-four meaningful expressions were extracted from the interviews resulting in seven categories concerning the practices of efficiency management in innovation functions. These categories are: 1) product development management tools, 2) project termination mechanism, 3) project resource management, 4) regular project progress appraisal, 5) collaboration management, 6) quality management, and 7) project feasibility screening.

1) Product Development Management Tools

This category refers to the various management tools and method employed in the iHPOs to manage for efficiency of innovation projects. Included in this category are (1) Agile methodology, and (2) product lifecycle management software.

(1) Agile Methodology

One of the common tools mentioned in the interviews was Agile methodology; Agile methodology is a method for software development project to cope with the fast changes occurring frequently in a project.

Two companies (13.3% of the participants) explicitly mentioned they used Agile methodology in their work. Company 3-LL, for example, mentioned that they managed a project by following Agile methodology which they claimed as a proven method for software development. Likewise, Company 3-JJ indicated that they utilized Agile, together with other tools e.g. Kanban, Kaizen etc. which helped manage efficiency of the projects.

The above findings are in agreement with Petersen and Wohlin (2010) who conducted a longitudinal research on the efficiency of Agile methodology compared to the conventional plan-driven project management method

and found significant improvement in terms of efficiency in Agile methodology than the conventional ones.

(2) Product Lifecycle Management Software

This was mentioned by one manufacturing-trading company, 1-CB (6.7% of the participants) who used this software to track the efficiency of an innovation along the path from inception to the commercialization providing data for effective decision-making regarding the new products. This software linked all related functions to view the same data so as to have the same picture of the project progress.

Product life-cycle management is suggested by Gmelin and Seuring (2014) to be included in the new product management process. In their study, they elaborate on the impact of the three dimensions of product life-cycle management, i.e. product data management, process management, and engineering project management, on facilitating the integration of new product development, and propose firms to include product life-cycle management system in their new product development project, so as to mitigate the challenges caused by diverse locations of design teams, product variation, and time-to-market pressure. Through the product life-cycle management systems, globally-dispersed design processes can become streamlined across relevant work units or organizations, development accuracy due to a joint database can be enhanced, and the utilization of cross-company capabilities can be established (Gmelin & Seuring 2014). Therefore, the product life-cycle management software mentioned in the findings is empirically informed to enhance the efficiency of innovation project management per se.

2) Project Termination Mechanism

This refers to the management practices in putting an end to an innovation project in order to stop wasting resources on an unviable project and deploy the resources for use elsewhere.

Three companies (20.0% of the participants) mentioned the mechanism presence in one form or another to put an end to a failing project. Company 1-SB, for example, said that they had monthly innovation meetings where they updated one another on movement of each project. They met to evaluate the viability of projects, in order to weed out ones that did not show signs of success. Similarly, Company 1-TA

mentioned that if over time a research did not produce result as expected, they would pull out the plug to terminate it and looked for new ways to work. Likewise, Company 2-UI said the management monitored the viability of each innovation. If a project deadline was repeatedly extended, showing no sign of further progress whatsoever, the management would intervene to put those projects on hold and reshuffle the priority to other projects in the pipeline.

The findings on various practices of project termination illustrated the efficiency management of innovation project as informed by various scholars. For example, Amabile and Khaire (2008) who indicate creating mechanism to filter out ideas and terminate unviable ones as one of the roles of innovation leadership to maximize efficiency of innovation project. Similarly, Klingebiel and Rammer (2014) indicate termination of deteriorating projects prevents the escalation in the loss of resources.

3) Project Resource Management

This category involves the effective utilization of resources which, at some point, are limited, whatever the size of the companies. Effective and efficient utilization of resources are mentioned as key factors in managing for innovation and efficiency. In fact, the project resource management is covered in the discipline of Innovation Portfolio Management (IPM) which is a dynamic decision-making process, in which projects are evaluated and selected, and resources are allocated (Kock & Georg Gemünden, 2016).

There are three codes included in this category, namely, (1) reshuffling resources and priority; (2) budget control; and (3) timeline control.

(1) Reshuffling Resources and Priority

This code indicates the management of resources and the prioritization of promising innovation projects, so as to maximize the effectiveness and efficiency of corporate resource utilization.

Three companies (20.0% of the participants) mentioned this practice in their companies. Company 1-CB, for instance, said that when a new product project did not show sign of profitability it would be put on the shelf. The resources would then be deployed for effective use in other projects. The terminated project would serve as the source of learning, though. Likewise, Company 1-SB said

that if a project did not prove viable, then the committee would call it off and shift the resources and manpower to other more potential projects. Lastly, Company 2-UI indicated the importance of setting priority in utilizing resources, saying that in regard to the efficient use of resources, the R&D department themselves had to manage the priority of facility usage and the length of usage so as to maximize the efficiency of the facilities and the time management.

The findings from this study are in accordance with Klingebiel and Rammer (2014, p. 248) who discuss resource allocation for innovation portfolio management. They propose “a strategy of deliberate discrimination between projects that warrant further resource allocation and those that do not,” explaining that in case of a positive result from a project progress appraisal, further resource will be allocated for the project; whereas a negative result from project appraisal would mean pulling out the resource to terminate the project and re-allocate it for use in other new projects instead.

(2) Budget Control

This code refers to the management of budget in any project. It reflects the concerns and focus of companies on the efficient utilization of capital and resources even for innovation. This exhibits the management of paradox of slack resource and limitation of resource.

Four companies (26.7% of the participants) reflected the significance of budget control in an innovation project. One company, 3-IN, even claimed failure to manage for project efficiency might cause detrimental damage to the project. The interviewee said they failed in one project and made quite a loss. After a careful review and reflection, they identified the causes of failure, i.e. over-committing themselves, adding in additional features requirement from the client, lack of tight budget monitoring, and lack of strict project timeline management. They claimed the mistake was a good lesson learned for later projects in which they consequentially managed strictly in terms of project objectives, directions, budgeting and timeline management. Similarly, Company 2-NN described they took care to manage the budget within the budget-estimates submitted to the management. And lastly, Company 1-SA indicated the importance of budget management, saying that though the management

allocated budgets and gave free reign for project teams to manage; the teams had to exercise great care in managing the project within the budget.

This budget control is one of the elements contributing to innovation project efficiency, cited by Sánchez and Pérez (2002), who posit various cost and time management metrics among a few others. The scholars' proposition is well illustrated in the above-mentioned research findings.

(3) Timeline Control

This code refers to the management of project schedule to ensure on- time delivery of final output of a new product development project.

Six companies (40.0% of the participants) shared their common insights of setting milestones and priority of project tasks. For instance, Company 3-LL indicated that setting up milestone a project was important in bringing a project to its fruition; it was an imperative tool to manage the efficiency of a project. Likewise, Company 1-TA specified that project leaders had to set directions for the innovation efforts and layout the priority of each element, together with the timeline of the projects. Similarly, Company 2-PR indicated that in order to manage the time-efficiency of a project, they set some sort of milestones. At the early stages, they might not rush and push too hard on the timeline of the project, only at the final stages that they would speed up to meet deadlines. Lastly, Company 2-UI indicated the use of KPIs, explaining that the company set KPIs for R&D in terms of the number of products in the pipeline to turn into finished products that could pass the government authority tests. The KPIs were used to manage both the speediness and the effectiveness of the innovations.

The findings are supported by Sánchez and Pérez (2002), earlier mentioned, who propose project cost and timeline management as substantial elements for the innovation project efficiency and suggested setting up cost and timeline metrics to monitor on-going project progress. The scholars' proposition is well illustrated by the findings of this study.

4) Regular Project Progress Appraisal

This refers to the management of efficiency of a project by means of regular appraisal of project progress to be vigilant of any deviation that may arise so as to remedy it accordingly.

Two companies (13.3% of the participants) stated they had this practice in place to monitor and evaluate project progress at set interval to determine the next stage. For instance, Company 1-TA said that the company monitored the progress of any project continually. If they felt they had arrived at an impasse, they would have to consider changing course or put an end to it. By the same token, Company 3-GG indicated that they appraise any innovation project periodically. If it turned out all right at one stage, then they invested more for the next stage.

There is not much literature on this issue, only a couple of scholars found addressing this concept. For example, Klingebiel and Rammer (2014, p. 248) discuss the issue of resource allocation for innovation portfolio management. They propose “a strategy of deliberate discrimination between projects that warrant further resource allocation and those that do not.” In case of a positive result from project appraisal of an on-going project, further resource would be allocated for the project, whereas a negative result from project appraisal would mean pulling out the resources to terminate the project and allocate it for use instead in other new projects. McDonough and Leifer (1986), and Rothwell (1992) also briefly state that regular project progress appraisal is one critical success factor in managing for innovation project efficiency.

5) Collaboration Management

This category refers to the enhancement of inter-departmental collaboration which is necessary for innovation efforts. It includes setting KPIs for collaboration to ensure that every staff pays attention to the matter of collaboration.

Two companies (13.3% of the participants) stated they used KPIs to set the tone for collaboration among departments. For example, Company 2-UI said that they set KPIs for all support functions for collaboration, in enhancing the speed of innovation projects, such as the KPIs for prompt response to requests for raw material for experiments in R&D. Similarly, Company 2-DE indicated that each sales group was assigned KPIs for pushing new innovative solutions into the market.

This antecedent factor is well informed by several scholars. For example, Smith et al. (2017) confirm intra-organizational collaboration to be an antecedent of innovation; Hill et al. (2014) indicate collaboration as one of the four basic shared values (i.e. bold ambition, collaboration, learning and responsibility) of innovative organizations. And Tidd and Bessant (2009) stress the importance of effective team working as a component of innovative organizations. Therefore, any attempts to manage collaboration are by all means necessary for innovation project management. And the ideas of utilizing KPIs is in accordance with the earlier-mentioned scholars, Demartini and Mella (2014, p. e1), who posit that “performance management systems affected managers’ perception of satisfaction, the effectiveness of the control system and the performance related to process innovation”; and in line with Zhou, Hong, and Liu (2013) who confirm a positive correlation between performance management systems and firm innovation and performance.

6) Quality Management

This category is about quality control of an innovation project to ensure that quality is manifested in the finished products. This is in stark contrast with the endeavor for hasty product launch, downplaying or neglecting the quality aspect of the product.

Three companies (20.0% of the participants) expressed their attention to quality management issue in their innovation projects by allocating substantial amount of time or efforts to assure the quality of finished products. For example, Company 3-IN mentioned that small startups could turn out an application in just matter of weeks or days, while it took longer time for an established company like themselves to produce one software. However, on the downside, the speedy creation of an application was often accompanied by lack of quality or reliability of the product; it was prone with defects cropping up in the later stages. As an established company, they could not risk their reputation by such sloppy software; they had to pay attention to both the speed and quality of any software simultaneously. Likewise, Company 1-SA specified the importance of quality in innovation by explaining that the company fundamentally meant quality in every stage of innovation, ranging from design stage, through to the production process, including raw material procurement; they based their operations on TQM principles. Lastly, Company 3-DI explained that the company

adopted Japanese style of operations by spending only 25% of their efforts in software coding and over 50% on ensuring the top quality of the products.

The findings about quality management in innovation work are well covered by various scholars in the realm of innovation. For example, Rothwell (1992, p. 224) indicate some success factors in managing industrial innovation, such as, “Efficiency in development work and high-quality production: implementing effective quality control procedures; taking advantage of up-to-date production.” This points to the management of both efficiency and quality in innovation work, which is concurred by Asif (2017) who posits that statistic quality management system promote innovation and efficiency. Likewise, Burningham and West (1995) signify shared objectives for excellence and quality in innovation task as one factor that positively influenced innovation team climate. These researchers are in support of the findings of this study, which emphasize the simultaneous management of quality and innovation.

7) Project Feasibility Screening

This category refers to the feasibility study of a project proposal in an attempt to objectively consider the possibility of success and the return on investment of an innovation project. This is done up-front before the decision to go or not to go with the innovation proposal.

Seven companies (46.7% of the participants) indicated the use of feasibility study to screen out unpromising innovation initiative from the promising ones. For example, Company 1-CA said that the company had certain criteria for selection of innovation projects. These criteria included initiative, difficulty to duplicate by competitors, quality, novelty; market trend; market size; market share; return on investment; value for customers, benefits for stakeholder and the country; competitive price and cost; production capacity or readiness. Likewise, Company 1-CB explained that in the screening of innovation project they first evaluated the cost estimates, the chance of success and finally made a demo to gauge responses from customers before deciding whether to pursue the innovation project. Company 3-DI said the innovation work unit never really experienced any failed projects; because they would kill it in the study phase if they and the management agreed that the chance of success of the proposal was slim. Lastly, Company 2-SL indicated the use of feasibility study in project approval, explaining that in order to get an approval for a project, the proposal

maker had to make careful feasibility study to answer the board in various dimensions, which was because the committee members were from various backgrounds.

Several scholars are in agreement with the concept of screening promising projects from the unviable one. For example, Moenaert, Robben, Antioco, de Schamphelaere, and Roks (2010) indicate feasibility as one of the four factors in a strategic decision making on new product development (the remaining three factors are namely, the business opportunity, the competitiveness, and the leverage opportunities provided by the strategic option); while Rothwell (1992, p. 224) signifies “committing resources to up-front screening of new projects.”

In summary, the findings for Theme 4 revealed two codes of antecedents, despite low overall frequency, which showed rather high frequencies in some Groups. Case in point, Up-front project feasibility screening which was quoted by 80% of Group-1, indicated the practice in large organizations that focused on the effectiveness of project portfolio management. Another case in point, timeline control, was mentioned by 60% of Group-3 as an antecedent of time management in innovation. This indicated a moderate number of IT/high-tech companies in the study focused on project timeline management for best efficiency.

5.3.3.5 Theme 5: Leadership

This theme refers to the leadership for ambidexterity which speaks to the needs for management of both explorative and exploitative performance in iHPOs.

Twelve meaningful expressions were derived from the content analysis, forming two categories of leadership issues: 1) ambidextrous leadership, and 2) leadership team.

1) Ambidextrous Leadership

This category portrays the ambidextrous leadership who focuses on both innovation and business performance.

Two companies (13.3% of the participants) indicated this leadership traits in their organizations, such as being visionary; focusing on the business performance, concentrating on the business side of the projects on hand. For example, Company 1-CA pointed out that leaders of all organizations wanted the same things, i.e. new innovation, new products, and new service that were successful; while at the same time they also cared for growth, profit, stock price, brand reputation, etc.

Similarly, Company 3-IN said that innovative leaders had also to pay attention to the performance of the business. That is to say, while being visionary, he also had to focus on the business performance, concentrating on the business side of the projects on hand.

These findings point to the type of leadership that have to focus his/her management on innovation and corporate performance simultaneously; or in other words they have to be ambidextrous leaders. Several scholars indicated the significance of ambidextrous leadership; He and Wong (2004), for example, suggest the roles of leaders are to manage tension between exploration and exploitation on a continuous basis. Gibson and Birkinshaw (2004, p. 223) note the “important role played by senior executives in making an organization context effective and developing ambidexterity.” Similarly, O’Reilly III and Tushman (2008) best summarize the concept by positing that ambidexterity is a capability embedded in leaders’ learning and expressed through an ability to reconfigure existing organizational assets and competencies in a repeatable way to adapt to changing conditions.

2) Leadership Team

This category refers to the management teams or the heads of BU that form a management team. Ten meaningful expressions generated two codes in this category, namely, (1) management by committee, and (2) integration and cohesiveness of innovation management teams

(1) Management by Committee

This code refers to utilizing a committee in innovation management. Five companies (33.3% of the participants) indicated this practice in their organizations; some of the quotations are shown in the following. For example, Company 1-CB described that innovation management in the company was first started by trial and error and iteration basis. This eventually led to setting up of an innovation committee with clear guiding policies. Under this integrative committee setup, business units had been effectively facilitated to cooperate and share information of what each was doing. Likewise, Company 1-TA explained that new product innovation proposals had to go under the scrutiny of a committee composed of various management functions, e.g. Marketing, Finance, Factory. The committee would evaluate the feasibility of the new project proposals. If they agreed on the potential of the proposed new product, they would give the go-ahead. Further, Company 2-SL said that during

the early days of the company when it was a small private company, major investment decisions were made by the owner. However, after the company became a listed public company, any major investment on innovation had to go through the management committee comprising almost 10 people. This practice made it more difficult to convince the committee than before, and proposal makers had to respond to more questions from different people. Nonetheless, being able to pass through the scrutiny of the committee and got the approval almost always predicted the eventual success of the projects. Lastly, Company 1-SB said the innovation management in the company was executed by committee, who had high flexibility and mobility to convene meetings at any time.

This gave a clear picture of how iHPOs utilize a committee in their innovation management. The findings are well informed by various scholars who studied the effectiveness of management team and team processes in ambidextrous management. For instance, Tushman and O'Reilly III (1996) suggest that organizational ambidexterity is facilitated by top-management team process. By the same token, Smith and Tushman (2005) posit the integrative mechanisms of leadership teams that could successfully manage the contradictions arising from structural separation in ambidextrous organizations. Apparently, because a committee is composed of various members, the diversity in expertise and experience represented by disparate committee members also lend weight to the effectiveness of the management by committee (Miron-Spector, Erez, & Naveh, 2006).

(2) Integration and Cohesiveness of Innovation management teams

This category refers to the unity of an innovation management teams despite being from different work functions in a company.

Four companies (26.7% of the participants) described integration and cohesiveness of innovation management teams as a facilitating factor for managing efficiency and innovation. Company 2-SL, for instance, said that whenever there was a problem or conflict, the leaders would gather together and discussed on the solutions. The solutions to the problem might be for some parties to compromise, while others had to adjust their way of work, or they might even agree to stop the product in point and switched to others. This illustrated the cohesiveness and

unity in making decisions in the leadership team. Similarly, Company 1-CB mentioned a steering committee enacting innovation policies for working groups to follow. And owing to the fact that the committee consisted of members from disparate business units, they had to communicate closely to update each other on the happenings in their units so as to synchronize the overall understanding and efforts. Lastly, Company 1-SB indicated that though committee members were from different functions, they communicated closely with one another, and they held regular meetings to update and make decisions; they cooperated well as a team.

These examples illustrate the cohesiveness and unity of the management team in these iHPOs. This concept is very much in line with Smith and Berg (1987) who posit that capitalizing on team diversity and cohesiveness may enable exceptional group performance. Furthermore, O'Reilly III & Tushman (2004) indicate that strategic integration across units is enabled through the coordination of the cohesive senior management team.

In conclusion of Theme 5, despite low overall frequency, management by committee was quoted with high frequency at 80% in Group-1, showing the necessity of setting up committee for innovation project for the best effects in large organizations. Another antecedent, integration and cohesiveness of innovation management team, was quoted with 60% frequency rate, also by large organizations (Group-1). This latter code complemented the former one well because management by committee would need integration and cohesiveness to run the team with unity for efficiency.

5.3.3.6 Theme 6: Knowledge

This theme refers to the nature of knowledge in the sense of being explorative or exploitative. It reflects the same concept as discussed in the section of paradox of learning. Three meaningful expressions formed into only one single category of the theme, separation of knowledge focus. The category refers to separation of knowledge dimension into functional expertise and big picture perspective skills. Three companies specified this antecedent in their organizations. For example, Company 1-CB described that R&D staff normally had in-depth expertise in their disciplines, but often lack the big picture perspectives; while the management had a bird's eye view of various fields of knowledge, which was complementary to the

expertise of R&D team members. Similarly, company 1-SB indicated that even though it was a nice thing for leaders to have field-specific expertise, it was not necessary for leaders to have more in-depth knowledge than the followers because the field developed quickly, so quickly that the persons in a management position might not be able to keep up with the details. But, on the other hand, it was required that they had a broad perspective that enabled them to see the linkage between all elements of an innovation project and know the interaction between them, in order to manage the project efficiently. Lastly, Interviewee 3-JJ who was the company CEO said that he always had in his head the clear overall pictures of all projects and could guide the teams to take optimal actions if any deviation seemed to hamper the project.

Three companies indicated R&D people as normally having in-depth expertise while the management had a bird's eye view perspective, complementary to the in-depth expertise of team members.

These findings illustrate clearly the separation of explorative and exploitative learning between the operational and the management staff. This concept is confirmed by Katila and Ahuja (2002) who separate knowledge search into search depth and search scope. Search depth or learning for functional expertise is associated with the operational staff, while search scope or width of knowledge is associated with the leadership.

In conclusion, the findings for Theme 6 revealed that, despite low overall frequency, separation of functional expertise and big picture perspective skills was quoted with majority frequency at 66.7% in Group-1 companies, indicating the practice of separating exploitative and explorative knowledge role at different levels in large organizations.

5.4 Comparison of the 10 Highest Ranked Antecedents/Codes by Groups

This section discusses the comparison of the significant findings from overall results and the three separate groups of companies. There were 15 companies participating in this study, which were classified into Overall-Group comprising all the 15 companies; Group-1, Group-2 and Group-3 each consisting of five companies. Group-1 were the five companies with big innovation staff of 50-100 persons; Group-2 were five companies with medium innovation staff of under 50 persons; and Group-3 were five high-tech and IT companies where each product offering to the customer fundamentally involved innovation.

In this section, the terms antecedent factor, antecedent, factor, item, element, code and result are used interchangeably depending on the suitability of the context.

5.4.1 Research Question 1: “What are the Structure, Context, Culture that Enhance Innovation in Innovative and High-Performance Organizations?”

The findings for this research question revealed 80 antecedent factors that enhance innovation in the participating iHPOs. However, the following are the discussions on the 10 highest ranked antecedent factors of each group. Overall-Group results are the averaged results of the total participating companies, they are presented for overview, followed by results from Groups 1 to 3, which include discussion of each top code.

5.4.1.1 Overall-Group 10 Highest Ranked Antecedent Factors (RQ 1)

Table 4.6 reveals the 10 overall averaged highest ranked antecedent factors by all the 15 companies as follows: 1) support for opportunities and resources (theme 6: climate and culture), accounting for 86.7% of all the participants; 2) showing passion and/or involvement in innovation (theme 5: leadership), accounting for 80.0%; 3) cross-functional project teams (theme 1: structure), accounting for 73.3%; 4) functional expertise (theme 3: staff related elements), accounting for 73.3%; 5) internal spatial separation of structure (theme 1: structure), accounting for 73.3%; 6) customer insight and market intelligence (theme 8: environmental elements), accounting for

60.0%; 7) keeping pace with the latest technology (theme 3: staff related elements), accounting for 60.0%; 8) technological changes (theme 8: environmental elements), accounting for 60.0%; 9) flat structure (theme 1: structure), accounting for 53.3%; and 10) innovation as strategy and/or core-value (theme 6: climate and culture), accounting for 53.3% of all the participants.

The occurrence frequency of the top 10 ranked results ranged from min. 53.3% to max. 86.7%. When comparing the top 10 ranked results of all three groups against the Overall-Group, there was merely one factor concurred by all the three groups, i.e. showing passion and/or involvement in innovation; and seven factors were shared by two groups, i.e. cross-functional project teams; customer insight and market intelligence; functional expertise; innovation as strategy/core-value; internal spatial separation of structure; keeping pace with the latest technology; and support for opportunities and resources.

Detailed discussions of the top ranked items in each group are presented in next sections.

5.4.1.2 Group-1 Top 10 Ranked Antecedent Factors of Innovation (RQ 1)

Table 4.7 shows the 10 highest ranked antecedent factors by the five companies in Group-1, as follows: 1) innovation as strategy and/or core-value (theme 6: climate and culture), accounting for 100% of all five companies in Group-1; 2) innovation contest (theme 2: system-process-tool), accounting for 100%; 3) internal spatial separation of structure (theme 1: structure), accounting for 100%; 4) support for opportunities and resources (theme 6: climate and culture), accounting for 100%; 5) cross-functional project teams (theme 1: structure), accounting for 80.0%; 6) functional expertise (theme 3: staff related elements), accounting for 80.0%; 7) joint innovation with external parties (theme 7: knowledge), accounting for 80.0%; 8) showing passion and/or involvement in innovation (theme 5: leadership), accounting for 80.0%; 9) being visionary and communicating the vision (theme 5: leadership), accounting for 60.0%; 10) customer insight and market intelligence (theme 8: environmental elements), accounting for 60.0% of Group-1.

The top 10 results in Group-1 mostly concurred with the results in Overall-Group, sporting seven factors in common, such as, cross-functional project

teams; customer insight and market intelligence; functional expertise; innovation as strategy/core- value; internal spatial separation of structure; showing passion and/or involvement in innovation; and support for opportunities and resources.

Detailed discussions on the factors are presented below.

1) Innovation as strategy and/or core-value was quoted by 100% of Group-1. This illustrated the recognition of innovation strategies as an significant antecedents of innovation in big corporations, most likely owing to the importance of setting clear directions to guide the efforts of the huge workforce in big corporation to efficiently guide the alignment of all the departments in the companies and create a sense of belonging and commitment to organization objectives (Raisch, Probst & Tushman, 2011).

2) Innovation contest was utilized in all these companies because of the belief that innovation contest was a tool to motivate employees to participate in innovation organization-wide (Interviewee 1-CB) which is a concept supported by Boudreau, Lacetera and Lakhani (2011).

3) Internal spatial separation of structure was indicated by 100% of Group-1, because explorative and exploitative activities require different mindsets, skill sets, and motivations; therefore, an innovation unit needs to be physically and culturally separated from efficiency-driven units, and with its own incentive systems and managerial teams (O'Reilly III & Tushman, 2004). Furthermore, since these companies were all big corporations pursuing disruptive innovations; it is better for the structure of the explorative functions to be completely separated from exploitative units to facilitate effective pursuance of disruptive innovations (Christensen, 1998).

4) Support for opportunities and resources was identified by 100% of the companies in the group. These big organizations had been established for many years and had been honing their exploitative capabilities to be competitive in terms of cost, quality and reliability. In order to be prolific in innovative products, support in terms of opportunities to explore new things and resources to enable the endeavors are critical for the pursuance as such (Amabile, 1997; Burningham & West, 1995; Isaksen, 2017; Rothwell, 1992).

5) Cross-functional project teams were indicated by 80% of the companies in Group-1 as the structural form they utilized in their innovation units. This is supported by Lester (1998) who indicates that project teams are ideally efficient for new product developments. Further the teams comprised experienced and qualified team members and involved all relevant departments in the project from its earliest stages which are the critical success factors in technologically innovative team management. (McDonough & Leifer, 1986; Rothwell, 1992; Thamhain, 1990).

6) Functional expertise was cited by 80% of Group-1 as one of the antecedent factors of innovation in this group. This is in congruence with several scholars who posit that innovation depends on the expertise and motivation of the team members (Amabile, 1988; Ford, 1996; Woodman et al., 1993)

7) Joint innovation with external parties was quoted by 80% of Group-1. This factor was highly rated because it is an important source for access to new technology for innovation. This notion is well supported by the research positing that exploiting external sources of creativity and knowledge could increase organizational innovative capacity (Carlsson, Corvello, & Migliarese, 2009).

8) Showing passion and/or involvement in innovation is quoted by 80% of the companies in Group-1 because leaders' passion and involvement in innovation efforts have positive correlation with innovation (Jolly, 2008).

9) Being visionary and communicating the vision was indicated as a leadership quality for innovation by 60.0% of Group-1. This shows that over half of big corporations in this study require a leader who could form and communicate a future vision of what they should become and do to prosper and sustain in the long run.

This is in line with Brown and Eisenhardt (1995) who suggest that, for the best performance results, senior management should form a vision of objectives and communicate the vision to their teams while simultaneously giving team members the freedom to work autonomously within the scope of that vision.

10) Customer insight and market intelligence was indicated by 60% of Group-1 as an antecedent factor of innovation. This factor indicates an organization's focus on customers to gain the customer insight and market intelligence as external elements that guide their innovation efforts for the development of the right

products for the market. This is strongly supported by Asif and de Vries (2015), McDonough and Leifer (1986); Rothwell (1992); Wang, Zhao, and Voss (2016) who cite market orientation and the emphasis on satisfying user-needs and efficient customer linkages as critical success factor for industrial innovation.

5.4.1.3 Group-2 Top 10 Ranked Antecedent Factors of Innovation (RQ 1)

Table 4.8 displays the 10 highest ranked antecedent factors by Group-2 as follows: 1) internal spatial separation of structure (theme 1: structure), accounting for 100% of all five companies in Group-2; 2) customer insight and market intelligence (theme 8: environmental elements), accounting for 80.0%; 3) showing passion and/or involvement in innovation (theme 5: leadership), accounting for 60.0%; 4) keeping pace with the latest technology (theme 3: staff related elements), accounting for 60.0%; 5) flat structure (theme 1: structure), accounting for 60.0%; 6) good co-ordination between functions (theme 6: climate and culture), accounting for 60.0%; 7) Adaptability to changes in task environment (theme 5: leadership), accounting for 60.0%; 8) experiment orientation, trial and error (theme 6: climate and culture), accounting for 60.0%; 9) self-learning (theme 3: staff related elements), accounting for 60.0%; and 10) cross-functional project teams (theme 1: structure), accounting for 40.0% of Group-2.

Some of the findings indicated very high degree of concurrences among companies in Group-2, which were medium sized organizations with 50-100 innovation staff. There are only two codes that were mentioned with some significant frequency: internal spatial separation of structure, customer insight and market intelligence. Moreover, Group-2 showed five concurring items with the Overall-Group, such as, customer insight and market intelligence; flat structure; innovation as strategy/core-value; internal spatial separation of structure; and keeping pace with the latest technology. All the findings are discussed as follows:

1) Internal spatial separation of structure was mentioned by 100% of the 5 companies in Group-2. This showed that all the five companies opted for complete separation of structure for innovation unit, just like those in Group-1. This was owing to the fact that these companies, same as those in Group-1, also depended on new products to generate next stream of income (Interviewee 2-NN), therefore, it is better for the structure of the explorative functions to be completely separated from

exploitative units to be able to effectively pursue disruptive innovations (Christensen, 1998). This also indicated that if resources and manpower allow, even medium sized companies choose to separate innovation work units from the efficiency-driven work units.

2) Customer insight and market intelligence was agreed by 80.0% of Group-2 who emphasized market orientation, efficient customer linkages and satisfying user-needs as a critical success factor for industrial innovation, concurring with McDonough and Leifer (1986), Rothwell (1992), and Wang, Zhao, and Voss (2016).

3) Showing passion and/or involvement in innovation was indicated by 60% of Group-2 as an antecedent of innovation. This notion is corroborated by Jolly (2008) who posited that leaders' passion and involvement in innovation efforts have positive correlation with innovation.

4) Keeping pace with the latest technology was concurred by 60.0% of Group-2 as an antecedent factor conducive to innovation. In their industry, frequent disruptive innovations were normal, so there were needs to update the competency of the innovation team on a regular basis. This is well supported by Rothwell (1992) who specifies that linkages with external sources of knowledge and know-how provide accesses for updates on the development of the field which is critical for successful industrial innovation.

5) Flat structure was illustrated by 60.0% of Group-1 as an organizational structure most suitable for innovation function; this provided flexibility and autonomy in the management of innovation, amidst the hierarchical structure of the exploitation functions in the organizations. This concept of a flat structure is well supported by several scholars, such as, Daft (2015), Smith et al. (2017) who indicate a flat structure as an organizational structure suitable for innovation activities, owing to its decentralization and low formalization (Daft, 2015; Subramanian & Nilakanta, 1996).

6) Good co-ordination between functions was an antecedent of innovation exhibited by 60.0% of the group. These companies emphasized functional cooperation for innovation task among parties concerned. This notion is in line with McDonough and Leifer (1986) and Rothwell (1992) who indicate that effective

functional integration and involvement from parties concerned throughout a project are imperative in managing a successful innovation project. Furthermore, Thamhain (1990) specifies team involvement as a critical success factor in technologically innovative team management.

7) Adaptability to changes in task environment was indicated by 60.0% of the group as a factor required for organizational innovativeness, and hence innovation. The management were always flexible and ready to change and adapt to the ever-changing environment, so as to achieve the best possible result. The findings concur with Daft (2015) and Rothwell (1992) who emphasize the importance of organization flexibility. Specifically, Rothwell (1992) indicates corporate flexibility and adaptability to change as a critical success factor for organizations to cope with the stiff competition in the market.

8) Experiment orientation, trial and error was agreed by over half of Group-2 at 60.0% frequency. This refers to the preference for experiments over mere discussion in order to prove a creative idea. It includes experiment orientation, and trial and error culture. The findings are in agreement with Hill et al. (2014) and Garvin (1993), who illustrate that leaders had to build an environment in which people are able to collaborate, experiment and learn through trial and error.

9) Self-learning was agreed by 60.0% of Group-2 as factor conducive to innovativeness in employees. This concept is congruent with Banerjee and Kumar (2018) who state that acquisition of knowledge could be through external uncontrollable learning opportunities, and self-learning which is within oneself and well within one's control. In addition, Tohidi, Seyedaliakbar, and Mandegari (2012) suggest that learning within the organization is associated with higher creativity. Accordingly, it is well supported to infer that self-learning enhances creativity in these companies.

10) Cross-functional project teams were indicated by 40.0% of Group-2 as the structural form utilized in their innovation units. This is supported by Lester (1998) who indicates that project teams are ideally efficient for new product developments. Further the teams comprised experienced and qualified team members and involved all relevant departments in the project from its earliest stages which are

the critical success factors in technologically innovative team management. (McDonough & Leifer; 1986, Rothwell, 1992; Thamhain, 1990).

5.4.1.4 Group-3 Top 10 Ranked Antecedent Factors of Innovation (RQ 1)

Table 4.9 illustrates the 10 highest ranked antecedent factors by the five companies in Group-3 as follows: 1) support for opportunities and resources (theme 6: climate and culture), accounting for 100% of all five companies in Group-3; 2) showing passion and/or involvement in innovation (theme 5: leadership), accounting for 100%; 3) cross-functional project team (theme 1: structure), accounting for 100%; 4) functional expertise (theme 3: staff related elements), accounting for 100%; 5) keeping pace with the latest technology (theme 3: staff related elements), accounting for 100%; 6) technological changes (theme 8: environmental elements), accounting for 100%; 7) training or taking innovation courses (theme 7: knowledge), accounting for 80.0%; 8) taking responsibility and committed to his job (theme 3: staff related elements), accounting for 80.0%; 9) awareness of the latest business trends (theme 5: leadership), accounting for 80.0%; and 10) being visionary and communicating the vision (theme 5: leadership), accounting for 60.0% of Group-3.

The findings indicated six of the highest ranked items at 100% frequency rate.

Discussion on the top 10 items are presented as follows:

1) Support for opportunities and resources, just like in Group-1, was indicated unanimously by all the companies in the group as an antecedent factor for innovation. Since the business of this group was innovation-driven, it stands to reason that support for opportunities and resources, which are antecedent to innovation (Amabile, 1997; Burningham & West, 1995; Isaksen, 2017; Rothwell, 1992), are fully granted to the employees to enable them to produce the most satisfying solutions to the clients.

2) Showing passion and/or involvement in innovation is high on the list of important antecedents in Group-3. As mentioned earlier, the business of Group-3 companies was innovation-driven, therefore it was imperative for the leaders to fully exhibit passion and involvement in the innovation endeavors in the companies (Jolly, 2008).

3) Cross-functional project team was the common structure of the IT and high-tech companies. This is supported by Lester (1998) who indicates that project teams are ideally efficient for new product developments. Furthermore, the teams comprised experienced and qualified team members and involved all relevant departments in the project from its earliest stages; these attributes are the critical success factors in technologically innovative team management. (McDonough & Leifer, 1986; Rothwell, 1992; Thamhain, 1990).

4) Functional expertise was topmost on the list of the antecedent factors of innovation in this group because these companies were knowledge-intensive organizations where knowledge and expertise were fundamentally a production tool for all their products. Therefore, functional expertise was indisputably an important antecedent factor leading to innovation (Amabile, 1988; Ford, 1996; Woodman et al., 1993) in this group.

5) Keeping pace with the latest technology was imperative for IT and high-tech companies (Interviewee 3-JJ) because the competitiveness of these companies hinged on the latest development of technology; and therefore, it was necessary to establish effective linkages with external sources of scientific and technological know-how to keep pace with the latest development of the technology per se (Rothwell, 1992).

6) Technological changes were indicated by all the companies alike to be an antecedent factor leading to innovation. This is only natural considering that the nature of business of this group had to do fundamentally with IT and high-technology. Any changes in the technologies would basically affect their businesses as a whole. This element is in agreement with Drucker (1985) who indicates new knowledge, especially the new technological changes as one of the opportunities for companies to innovate new products. O'Reilly III and Tushman (2013) point to the correlation of technological changes to organizational adaptation. In closing, Thamhain (2003) indicates that technology is one of the external factors influencing innovative performance of an organization.

7) Training or taking innovation courses accounted for 80.0% quotes in Group-3; this was one of the knowledge sources for the employees. They developed their staff through training and innovation management courses both

domestic and overseas. This concept concurs with Morrison & Brantner (1992) who describe how training and some other development methods positively affect the employee's skills and knowledge for innovation.

8) Taking responsibility and committed to his job was accounted for by 80.0% of Group-3. These companies pointed to responsibility and commitment in finishing one's job as highly required in their innovation project teams. Responsibility was quoted by Hill et al. (2014) as one of the four basic shared values in innovation teams, namely, bold ambition, collaboration, learning, and responsibility.

9) Awareness of the latest business trends was mentioned by 80.0% of Group-3; this was a quality of a leader being dialed in to the latest business or technological trends. They stipulated this quality as required in their leaders. This concept is signified by Rothwell (1992) who indicates the effective linkages with external sources of scientific and technological know-how for update on the development in the field as a critical factor for successful industrial innovation.

10) Being visionary and communicating the vision was indicated as a leadership quality for innovation by 60.0% of Group-3. This shows that over half of IT and high-tech companies in this study require leaders who could form and communicate a future vision of what the companies should become and do to prosper and sustain in the long run. This is in line with Brown and Eisenhardt (1995) who posit that, for the best performance results, senior management should form a vision of objectives and communicate the vision to their teams while simultaneously giving team members the freedom to work autonomously within the scope of that vision.

Above showed that Group-3 had five items concurring with those of the Overall-Group, such as, cross-functional project teams; functional expertise; keeping pace with the latest technology; support for opportunities and resources; and technological changes. And the six top-ranked items all scored 100% frequency percentage; stressing the fact that antecedent factors were needed in innovation-driven companies.

5.4.2 Research Question 2: “What are the Paradoxes Encountered and Overcome in Achieving both Innovativeness and Efficiency (Ambidexterity)?”

There were rather low occurrences of meaningful expressions for this research question, probably because the interviewees thought of paradox as a conflict or obstacle, not as an idea involving two opposing thoughts or propositions. And because the participants believed their organizations were relatively well-managed, evidenced by the companies’ high performance, they did not see that many conflicts or obstacles encountered in their operations. As a result, only a small number of meaningful expressions for each code were extracted from the interviews.

5.4.2.1 Overall-Group Top Ranked Items (RQ 2)

Table 4.10 shows nine items with averaged frequency of occurrences of 6.7% to 20%. These items are laid out as follows: 1) paradox caused by demands for speedy completion of innovation projects (theme 2: paradox of explorative and exploitative demands), accounting for 20.0% of the participating companies; 2) paradox caused by resistance to change among exploitative functions (theme 4: paradox of change and continuity), accounting for 20.0%; 3) paradox caused by lack of cooperation from other functions (theme 1: paradox of cross-functional collaboration and own performance), accounting for 13.3%; 4) paradox caused by lack of interpersonal skills (theme 3: paradox of individual focus vs. team collaboration), accounting for 13.3%; 5) paradox caused by time pressure (theme 5: paradox of resource insufficiency), accounting for 13.3%; 6) paradox caused by heavy workload (theme 5: paradox of resource insufficiency), accounting for 13.3%; 7) paradox caused by cost control in innovation projects (theme 2: paradox of explorative and exploitative demands), accounting for 6.7%; 8) paradox caused by insufficient resources (theme 5: paradox of resource insufficiency), accounting for 6.7%; and 9) paradox caused by lack of knowledge and know-how (theme 6: paradox of learning), accounting for 6.7% of all the participating companies.

Groups-1 findings concurred with all but two items in the Overall-Group; the two items were paradox caused by insufficient resources and paradox caused by lack of knowledge and know-how which were not cited by any company in the group.

Group-2 findings also concurred with all but two items, i.e. paradox caused by cost control and paradox caused by lack of cooperation from other functions.

Group-3 concurred with only one item, paradox caused by demands for speedy completion of innovation projects, with 20.0% occurrence.

Out of the nine items in this Overall-Group, only one item was shared across all three groups i.e. paradox caused by demands for speedy completion of innovation projects. However, Group-1 and -2 commonly shared five items in this table, namely, paradox caused by demands for speedy completion of innovation projects; paradox caused by resistance to change; paradox caused by cost control; paradox caused by insufficient resources, and paradox caused by lack of knowledge and know-how.

5.4.2.2 Group-1 Ranked Items (RQ 2)

Table 4.11 displays the seven ranked items in Group-1 as follows: 1) lack of cooperation from other functions (theme 1: paradox of cross-functional collaboration and own performance), accounting for 40.0% of the companies in the group; 2) paradox caused by demands for speedy completion of innovation projects (theme 2: paradox of explorative and exploitative demands), accounting for 20.0%; 3) paradox caused by resistance to change (theme 4: paradox of change and continuity), accounting for 20.0%; 4) paradox caused by lack of interpersonal skills (theme 3: paradox of individual focus vs. team collaboration), accounting for 20.0%; 5) paradox caused by time pressure (theme 5: paradox of resource insufficiency), accounting for 20.0%; 6) paradox caused by heavy workload (theme 5: paradox of resource insufficiency), accounting for 20.0%; 7) paradox caused by cost control in innovation projects (theme 2: paradox of explorative and exploitative demands), accounting for 20.0%.

Detailed discussions are presented as follows:

1) Paradox Caused by Lack of Cooperation from Other Functions: Lack of cooperation was an obstacle causing challenges in balancing one's own performance and cooperation with innovation work units, the latter hampered the short-term performance of his/her own responsible tasks. This is supported by Smith and Lewis (2011); and Jarzabkowski and Sillince (2007), who cite that some paradoxes stem from the needs to fulfil plurality of goals from internal and external stakeholders.

Often, a non-innovation department chooses to fulfil their job obligations instead of spending time and manpower collaborating with innovation project which may reduce the capacity to maximize its own performance.

Various solutions for this paradox were implemented by a few companies, e.g. setting KPIs for collaboration (Company 1-TA), integrated and cohesive cross-functional leadership teams (Company 1-CB), alignment of relevant functions (Company 1-CB),

2) Paradox Caused by Demands for Speedy Completion of Innovation Projects: Demand for speed created a paradox because speed is clearly an element of exploitative activities that enhances efficiency of execution, while innovation is an explorative activity which enhances search for novelty and requires freedom from time constraint (March, 1991; Amabile, 1997).

Two solutions were illustrated for this paradox: investment for abundant facilities (Company 2-UI, 3-JJ) and simplification of processes (Company 1-CB).

3) Paradox Caused by Resistance to Change: Resistance to change was an element that created a paradox between change and continuity. This is owing to clinging to status quo or sticking to existing processes that have been around for a long time, especially in well-established big corporations. Any radical innovation that might fail in the market or that will change the original ways of work will often encounter resistance to changes. Various scholars explained that resistance to change emerges from a tendency to stick to the tried-and-true methods of work, which ensures existing work performance (Fosfuri & Rønde, 2009). Since innovation always involves changes (Cummings & O'Connell, 1978), resistance to change thus hampers innovation; and consequentially poses a paradox for the management to solve.

There was one solution specified by Company 1-TA for this paradox, i.e. getting everyone exposed to innovation.

4) Paradox Caused by Lack of Interpersonal Skills: Lack of interpersonal skills was referred to by the interviewees as lack of communication skill, relationship building, socialization, and was cited as an obstacle to interaction with other team members which might consequentially hampered the collaboration from other team members in brainstorming on the individual's initiative idea when it arises,

thus poses a paradox of individual vs. team creativity. This paradox is consistent with Hill et al. (2014) who identify the paradox of individual and group focus as an issue to overcome.

There were two solutions put forth for this paradox: emphasizing team brainstorming on individual's initiative ideas (Company 2-DE, 2-NN) and team efforts in idea implementation (Company 2-NN, 2-SL).

5) Paradox Caused by Time Pressure: Time pressure was indicated as an obstacle that created a paradox between the focus on efficiency in high performance organization and the efforts gearing towards innovation. It is a paradox because innovation does not come about by force but by granting time for idea incubation (Amabile et al., 1996; Isaksen, 2017).

Company 2-NN solved this paradox via efficient reshuffling manpower between projects.

6) Paradox Caused by Heavy Workload: Heavy workload was indicated as a hindrance for innovation owing to the lack of manpower and causes the paradox of efficiency and innovation. It poses a paradox because over-workload reduces idea time that is required for creativity (Isaksen, 2017), consequently created a paradox in innovation management.

The same solution as in 5) above, that is, efficient reshuffling manpower between projects applied to this paradox as well.

7) Paradox Caused by Cost Control: Cost control was indicated as a challenge to innovation because innovation people often lacked cost control ability, the notion of which is supported by McCrae (1987), and Oldham and Cummings (1996) who posit that innovative people lack conscientiousness while conscientious people lack innovation. Company 1-CB implemented a solution for this paradox, that is, getting cost conscious persons to manage cost control.

5.4.2.3 Group-2 Ranked Items (RQ 2)

Table 4.12 displays the seven ranked items in Group-2 as follows: 1) paradox caused by resistance to change (theme 4: paradox of change and continuity), accounting for 40.0% of the companies in Group-2; 2) paradox of speedy completion of innovation projects (theme 2: paradox of explorative and exploitative demands), accounting for 20.0%; 3) paradox caused by lack of interpersonal skills (theme 3:

paradox of individual focus vs. team collaboration), accounting for 20.0%; 4) paradox caused by time pressure (theme 5: paradox of resource insufficiency), accounting for 20.0%; 5) paradox caused by heavy workload (theme 5: paradox of resource insufficiency), accounting for 20.0%; 6) paradox caused by insufficient resources (theme 5: paradox of resource insufficiency), accounting for 20.0%; 7) paradox caused by lack of knowledge and know-how (theme 6: paradox of learning), accounting for 20.0% of companies in Group-2.

Detailed discussions on the items are as follows:

Five items, 1), 2), 3), 4), and 5) were already discussed in previous section:

1) Paradox Caused by Resistance to Change: Already discussed in 5.4.2.2 3).

2) Paradox Caused by Demands for Speedy Completion of Innovation Projects: Already discussed in 5.4.2.2 2).

3) Paradox Caused by Lack of Interpersonal Skills: Already discussed in 5.4.2.2 4).

4) Paradox Caused by Time Pressure: Already discussed in 5.4.2.2 5).

5) Paradox Caused by Heavy Workload: Already discussed in 5.4.2.2 6).

6) Paradox Caused by Insufficient Resources: Insufficient resource was indicated as a cause of the paradox of resources allocation for innovation efforts, because without sufficient budget for equipment and facilities, it was very difficult to get the project completed speedily and smoothly.

The solution proposed for this paradox was for the concerned parties to strictly apply project budget control procedures throughout the project (Interviewee 2-IN). This budget control is one of the elements contributing to innovation project efficiency, cited by Sánchez and Pérez (2002), who posited various cost and time management metrics among a few others

7) Paradox Caused by Lack of Knowledge and Know-How: Lack of knowledge and know-how was cited as one of the obstacles in managing innovation project especially when it involved new technology that the staff never

learned of or knew of before. The obstacle led to the paradox of learning where companies had to vacillate between learning new knowledge and refining existing one (O'Reilly III & Tushman, 2008).

Various solutions to solve the paradox were proposed by various companies in the study, such as, job rotation (Company 1-SB), hiring new competency (Company 1-TA, 2-DE, 2-SL), separation of functional expertise role and big picture perspective role (Company 1-CB, 1-SB, 3-JJ).

5.4.2.4 Group-3 Ranked Items (RQ 2)

Table 4.13 reveals that there was only one item generated in this group, that is, paradox of demands for speedy completion of innovation project. The discussion on this item and the solutions were already discussed in 5.4.2.2 2). The absence of most of the paradox items could probably be interpreted that innovation-driven companies such as Group-3 were incorporated with a business model that strongly prioritized explorative activities and so the whole organizations were aligned for such model which was inclined towards exploration, therefore downplayed the lesser exploitative functions in the companies, which resulted in the ignorance of the contradictory demand for efficiency. Nonetheless, this did not rule out the possibility of theoretical paradoxes of efficiency and innovation in these companies.

5.4.3 Research Question 3: “How do these Organizations Manage for Ambidexterity (Innovation and Efficiency)?”

The findings for this research question revealed 22 antecedent factors of ambidexterity in the participating iHPOs. Following are the discussions on the 10 highest ranked antecedent factors of each group. Overall-Group results are the averaged results of the total participating companies, they are presented for overview, followed by results from Groups 1-3 which include discussion on the significant results.

5.4.3.1 Overall-Group Top 10 Ranked Antecedent Factors of Ambidexterity (RQ 3)

Table 4.14 shows the 10 Overall-Group highest ranked antecedent factors of ambidexterity as follows: 1) focusing corporate strategy on innovation and efficiency (theme 2: strategic management), accounting for 73.3%; 2) separated work unit for innovation (theme 1: structure), accounting for 73.3% of the total companies;

3) setting directions for innovation (theme 2: strategic management), accounting for 46.7%; 4) up-front project feasibility screening (theme 4: project control procedures), accounting for 46.7%; 5) timeline control (theme 4: project control procedures), accounting for 40.0%; 6) management by committee (theme 5: leadership), accounting for 33.3%; 7) budget control (theme 4: project control procedures), accounting for 26.7%; 8) integration and cohesiveness of innovation management team (theme 5: leadership), accounting for 26.7%; 9) innovation talent management (theme 3: performance systems), accounting for 20.0%; and 10) performance management system (theme 3: performance systems), accounting for 20.0% of the total 15 companies.

The occurrence frequency of the top 10 ranked results ranged from min. 20.0% up to max. 73.3%. When comparing top 10 ranked results of all three groups with the Overall-Group, there were four one factors shared across all the three groups, focusing corporate strategy on innovation and efficiency; separated work unit for innovation; setting directions for innovation; up-front project feasibility screening.

5.4.3.2 Group-1 Top 10 Ranked Antecedent Factors of Ambidexterity (RQ 3)

Table 4.15 shows the 10 highest ranked antecedent factors of ambidexterity are displayed as follows: 1) separated work unit for innovation (theme 1: structure), accounting for 100.0%; 2) focusing corporate strategy on innovation and efficiency (theme 2: strategic management), accounting for 100.0%; 3) up-front project feasibility screening (theme 4: project control procedures), accounting for 80.0%; 4) management by committee (theme 5: leadership), accounting for 80.0%; 5) setting directions for innovation (theme 2: strategic management), accounting for 60.0%; 6) integration and cohesiveness of innovation management team (theme 5: leadership), accounting for 60.0%; 7) performance management system (theme 3: performance systems), accounting for 40.0%; 8) termination of unviable projects (theme 4: project control procedures), accounting for 40.0%; 9) reshuffling resources and priority (theme 4: project control procedures), accounting for 40.0%; 10) separation of functional expertise role and big picture perspective role (theme 6: knowledge), accounting for 40.0%;

The top two antecedents were indicated by 100% of the companies in the group, while the next two items were rated at 80%. This illustrated the significance of the factors toward ambidexterity in these organizations.

Detailed discussions of the top 10 antecedents are presented in the following.

1) Separated Work Unit for Innovation: This structure was opted by 100% of the companies in Group-1. It proved the significance of shielding the explorative functions from interference from exploitative functions to facilitate both functions in the companies.

A theoretical discussion has evolved around the question of whether and to what extent explorative and exploitative units should be separated. Owing to the different mindsets, skill sets, and motivations required in the contrasting units, some suggested the units are physically and culturally separated from each another, and each having its own incentive systems and managerial teams (O'Reilly III & Tushman, 2004). Benner and Tushman (2003), and Tushman & O'Reilly III (1996) suggest the structure for an innovation-driven function to be a small, decentralized one, with loose processes in contrast to the larger, more centralized structure coupled with tight processes for an efficiency-driven function. Likewise, these findings are exactly informed by Christensen (1998) who suggests total separation of explorative units from exploitative ones in order to pursue disruptive innovation without interfering from the latter.

2) Focusing Corporate Strategy on Innovation and Efficiency: One hundred percent of the group indicated they employed strategies for innovation and efficiency, representing their orientation toward ambidexterity management

From the principle proposed by March (1991), and supported by others such as, Holmqvist, (2003), and Leonard-Barton, (1992), organizations must maintain strategies that emphasize both innovation and performance efficiency by allocating resources both to the refinement of existing technologies, the leveraging of existing competencies and also to the development of new skills and capabilities, so that organization will not achieve immediate reliability at the future risk of becoming

obsolete, or vice versa. The findings from this study are in agreement with what ambidexterity scholars had to offer to business practitioners aiming at being iHPOs.

3) Up-Front Project Feasibility Screening: Eighty percent of the companies indicated the importance of managing the effectiveness of innovation project portfolio by installing feasibility screening procedures to filter out unviable projects early in the processes.

Several scholars are in agreement with this concept. For example, Rothwell (1992, p. 224) signifies “committing resources to up-front screening of new projects”; while Moenaert, Robben, Antioco, de Schamphelaere, and Roks (2010) indicate feasibility as one of the four factors in a strategic decision making on new product development; incidentally, the remaining three factors were namely, the business opportunity, the competitiveness, and the leverage opportunities provided by the strategic option.

4) Management by Committee: Eighty percent of the group indicated they utilized committee for innovation management to benefit from diversity of knowledge, expertise, experience and perspectives of the committee. This gave a clear picture of how iHPOs utilized a committee in their innovation management. The findings are well informed by various scholars who studied the effectiveness of management team and team processes in ambidextrous management. For instance, Tushman and O'Reilly III (1996) suggest that organizational ambidexterity is facilitated by top-management team process. By the same token, Smith and Tushman (2005) posit the integrative mechanisms of leadership teams that could successfully manage the contradictions arising from the structural separation in ambidextrous organizations. Apparently, because a committee is composed of diverse members, the diversity in expertise and experience represented by the disparate committee members positively affect the effectiveness of the management by committee (Miron-Spector, Erez, & Naveh, 2006).

5) Setting Directions for Innovation: Sixty percent illustrated they had set clear directions for innovation and incorporated it into the corporate strategy and core values.

An optimal strategy for innovation in high-performance organizations would effectively secure a focus for innovation amidst the conventional

focus on efficiency typical of high-performance organizations. This serves as a guiding principle for iHPOs to realize ambidexterity (March, 1991; Smith et al., 2017).

6) Integration and Cohesiveness of Innovation Management Team: Sixty percent of the group illustrated the integration and cohesiveness of the innovation management team/committee in the companies. Because the committee consisted of members from disparate business units, they had to communicate closely to update each other to synchronize the overall understanding and efforts to create cohesiveness and integration in the leadership team for effective decision making.

This concept is very much in line with Smith and Berg (1987) who posit that capitalizing on team diversity and cohesiveness can enable exceptional group performance. Furthermore, O'Reilly III & Tushman (2004) indicate that strategic integration across units is enabled through the coordination of the cohesive senior management team.

7) Performance Management System: Forty percent of the companies utilized performance management system covering both exploitative and explorative work units. This showed the emphasis on managing for ambidexterity in the companies.

The findings are in agreement with Zhou, Hong, and Liu (2013) who confirm the positive correlation between performance management systems and firm innovation and performance. Furthermore, Demartini and Mella (2014, p. e1) indicate that “performance management systems affected managers’ perception of satisfaction, the effectiveness of the control system and the performance related to process innovation”. The findings and the scholars all point to the deployment of performance management system in organizations that aim at becoming iHPOs.

8) Termination of Unviable Projects: Forty percent of the group had some sort of mechanisms to put an end to the projects that showed no signs of progress, profitability or efficient usage of resources.

The findings on the practices of project termination represent the efficiency management of innovation project as informed by various scholars. For example, Amabile and Khaire (2008) indicate creating mechanism to filter out ideas and terminate unviable ones as one of the roles of innovation leadership to maximize

efficiency of innovation project. Similarly, Klingebiel and Rammer (2014) suggest that termination of deteriorating projects prevents the escalation in the loss of resources.

9) Reshuffling Resources and Priority: Forty percent illustrated this as one of the methods in managing for innovation projects efficiency by shuffling, scheduling usage among projects and re-allocation of facility and resources among projects.

Effective and efficient utilization of resources are mentioned by scholars as key factors in managing for innovation and efficiency (Klingebiel & Rammer, 2014; Kock & Georg Gemünden, 2016).

10) Separation of Functional Expertise Role and Big Picture Perspective role: Forty percent of the group indicate the importance of separating knowledge roles between the innovation operation people and the management. They assigned the knowledge role of big picture perspective to the management and the functional expertise role to the people in operation.

This concept is confirmed by Katila and Ahuja (2002) who separate knowledge search into search depth and search scope. Search depth or learning for functional expertise is associated with the operational staff, while search scope or width of knowledge is associated with the leadership.

5.4.3.3 Group-2 Top 10 Ranked Antecedent Factors of Ambidexterity (RQ 3)

Table 4. 16 displays the 10 highest ranked antecedent factors of ambidexterity as follows: 1) separated work unit for innovation (theme 1: structure), accounting for 100% of the five companies in Group-2; 2) focusing corporate strategy on innovation and efficiency (theme 2: strategic management), accounting for 60.0%; 3) up-front project feasibility screening (theme 4: project control procedures), accounting for 40.0%; 4) timeline control (theme 4: project control procedures), accounting for 40.0%; 5) budget control (theme 4: project control procedures), accounting for 40.0%; 6) innovation talent management (theme 3: performance systems), accounting for 40.0%; 7) setting KPIs for inter-departmental cooperation (theme 4: project control procedures), accounting for 40.0%; 8) setting directions for innovation (theme 2: strategic management), accounting for 20.0%; 9) management by committee (theme 5: leadership), accounting for 20.0%; 10) integration and

cohesiveness of innovation management team (theme 5: leadership), accounting for 20.0% of the five companies in Group-2.

Discussions on the antecedents are presented in the following.

1) Separated Work Unit for Innovation: This was a structure opted by 100% of the companies in Group-2. It showed unanimous concurrence across all companies on the importance of shielding the explorative functions from interference from exploitative functions, in order to facilitate both functions in the companies. Detail of this antecedent was discussed in 5.4.3.2 1).

2) Focusing Corporate Strategy on Innovation and Efficiency: Sixty percent of the group indicated they employed strategies for innovation and efficiency, representing their orientation toward ambidexterity management. Detail of this antecedent was discussed in 5.4.3.2 2)

3) Up-Front Project Feasibility Screening: Forty percent of the companies showed the importance of managing the effectiveness of innovation project portfolio by installing feasibility screening procedures to filter out unviable projects early in the processes. Detail of this antecedent was discussed in 5.4.3.2 3).

4) Timeline Control: Forty percent of the group indicated this as an antecedent factor in their companies. This code refers to the management of project schedule to ensure on-time delivery of final output of a new product development project.

The findings are supported by earlier mentioned Sánchez and Pérez (2002) who propose project cost and timeline management as substantial elements for the innovation project efficiency and suggest setting up cost and timeline metrics to monitor on-going project progress.

5) Budget Control: Forty percent of the group mentioned they practiced budget management in projects, which reflects the concerns and focus of companies on the efficient utilization of capital and resources even in innovation projects. This exhibits the management of paradox of slack resource and limitation of resource.

This budget control is one of the elements contributing to innovation project efficiency, cited by Sánchez and Pérez (2002), who suggest various

cost and time management metrics among a few others. The scholars' proposition is well illustrated in the above-mentioned research findings.

6) Innovation Talent Management: Forty percent of the group utilized talent management system in the development and retention of innovation talents.

The findings are in line with Marin-Garcia, Aznar-Mas, and Gonzalez-Ladrón-de-Guevara (2011) who indicate that companies need to manage their talents well to become innovative.

7) Setting KPIs for Inter-Departmental Cooperation: Forty percent mentioned they set KPIs to enhance inter-departmental collaboration.

The concept of utilizing KPIs is in accordance with Demartini and Mella (2014, p. e1), mentioned earlier, who propose that "performance management systems affected managers' perception of satisfaction, the effectiveness of the control system and the performance related to process innovation"; and in line with Zhou, Hong, and Liu (2013) who confirm positive correlation between performance management systems and firm innovation and performance.

8) Setting Directions for Innovation: Twenty percent illustrated they had set clear directions for innovation and incorporate it into the corporate strategy and core values. Detail of this antecedent was discussed in 5.4.3.2 5).

9) Management by Committee: Twenty percent of the group mentioned this antecedent. Detail of this antecedent was discussed in 5.4.3.2 4).

10) Integration and Cohesiveness of Innovation Management Team: Twenty percent of the group mentioned this antecedent. Detail of this antecedent was discussed in 5.4.3.2 6).

5.4.3.4 Group-3 Top 10 Ranked Antecedent Factors of Ambidexterity (RQ 3)

Table 17 displays the 10 highest ranked antecedent factors of ambidexterity are displayed as follows: 1) focusing corporate strategy on innovation and efficiency (theme 2: strategic management), accounting for 60.0%; 2) setting directions for innovation (theme 2: strategic management), accounting for 60.0%; 3) timeline control (theme 4: project control procedures), accounting for 60.0%; 4) quality

control in every innovation stage (theme 4: project control procedures), accounting for 40.0%; 5) agile methodology (theme 4: project control procedures), accounting for 40.0%; 6) separated work unit for innovation (theme 1: structure), accounting for 20.0%; 7) up-front project feasibility screening (theme 4: project control procedures), accounting for 20.0%; 8) budget control (theme 4: project control procedures), accounting for 20.0%; 9) performance management system (theme 3: performance systems), accounting for 20.0%; 10) separation of functional expertise role and big picture perspective role (theme 6: knowledge), accounting for 20.0% of the five companies in Group-3.

Detailed discussions of the top 10 antecedents are presented in the following.

1) Focusing Corporate Strategy on Innovation and Efficiency (theme 2: strategic management), accounting for 60.0%;

2) Setting Directions for Innovation (theme 2: strategic management), accounting for 60.0%;

3) Timeline Control (theme 4: project control procedures), accounting for 60.0%;

4) Quality Control in Every Innovation Stage: Forty percent of the group indicated they had quality management in an innovation project to assure high quality in the finished products. This is in stark contrast with the endeavor for hasty product launch, downplaying or neglecting the quality aspect of the product.

The findings are in line with various scholars. For example, Asif (2017) posit that statistic quality management system promotes innovation and efficiency. Likewise, Burningham and West (1995) signify shared objectives for excellence and quality in innovation task as one factor that positively influence innovation team climate, and Rothwell (1992) indicates implementing effective quality control procedures as one of the antecedents of successful industrial innovation. This signifies the management of both efficiency and quality in innovation endeavors.

5) Agile Methodology : Forty percent of the group mentioned Agile methodology as a tool for innovation project management to cope with the fast changes occurring frequently in projects.

The concept is supported by Petersen and Wohlin (2010) who conducted a longitudinal research on the efficiency of Agile methodology compared to the conventional plan-driven project management method and found significant improvement in terms of efficiency in Agile methodology than the conventional ones.

6) Separated Work Unit for Innovation: Twenty percent of the group indicated separation of innovation from other functions to prevent interferences from other function. Detail of the antecedent was discussed in 5.4.3.2 1).

7) Up-Front Project Feasibility Screening: Twenty percent of the group indicated the importance of managing the effectiveness of innovation project portfolio by installing feasibility screening procedures to filter out unviable projects early in the processes. Detail of the antecedent was discussed in 5.4.3.2 3).

8) Budget Control: Twenty percent of the group mentioned they practiced budget management in projects, which reflects the concerns and focus of companies on the efficient utilization of capital and resources even in innovation project. This exhibits the management of paradox of slack resource and limitation of resource. 5.4.3.3 5)

9) Performance Management System : Twenty percent of the group indicated the use of performance management system. Detail of the antecedent was discussed in 5.4.3.2 7).

10) Separation of Functional Expertise role and big picture perspective role: Twenty percent of the group indicated the separation of knowledge roles between the innovation operation people and the management. Detail of the antecedent was discussed 5.4.3.2 10).

5.5 Recommendations for Practice

The framework derived from this research gives a bird's-eye view of the concept of ambidextrous organization management which might not be available before in the Thai business context. This could well serve as the introduction of the topic in Thailand and serve as a springboard for those who would like to explore deeper into the field. Startup may gain the most from this framework as they are most likely the

parties that dive headlong into innovation and, by nature of an innovator, neglect the efficiency side of business. This framework could give them some insight as to how to balance innovation with efficiency in their business. At the same time, high-performance organizations that are striving to build innovation culture and environment into their organizational context could also well benefit from what this conceptual framework has to offer.

Amidst the fast-changing business landscape of today, in order to survive, prosper and sustain far into the future, there are pressing needs for present-day organizations to adapt themselves to cope with the digital disruption dominating the business hemisphere. Following is a recommendation list of antecedent factors and interventions for organizations to become innovative high-performance organizations (iHPOs). These are compiled from the research findings backed up by opinions from various theorists of the fields. These antecedents comprehensively cover the organizational structure, context and leadership dimensions.

In the following sections, the word exploration is used to refer to innovation; while the phrase exploitative function refers to efficiency-driven function.

5.5.1 Separation of Structure for Innovation

The findings indicated that most of the organizations in the study, except those in the IT and high-tech industry, clearly separated innovation function as an independent work unit. This notion might serve as a guideline for efficiency-driven or exploitative organization to consider separating an autonomous work unit to handle explorative activities, specifically, those of R&D or innovation center. Owing to the different mindsets, skill sets, and motivations required in the contrasting functions, the innovation unit should be physically and culturally separated, with its own incentive systems and managerial teams. The structure for an innovation-driven function could be small, decentralized, with loose processes in contrast to the larger, more centralized structure coupled with tight processes of an efficiency-driven function. Total separation is the more so required if organizations want to seriously pursue disruptive innovation without interference from other explorative work units. The structure of the innovation unit should be flat with as few hierarchical layers as possible, decentralized, and with low formalization.

5.5.2 Alignment of Explorative and Exploitative Functions

With the separation of explorative and exploitative functions in place, care should also be taken to keep the alignment between the two functions for the best collaboration in the implementation of an innovation project. Amidst the day-to-day operations, efficiency-driven work units can be busy minding their own performance KPIs. And in so doing, they may lose sights of the collaboration that must be offered to the innovation function. This is the paradox of plural goals, caused by the demand for one's own performance and that of the innovation unit which might contradict each other in the operations. Under this work atmosphere, there are needs for the company to regroup the attention of all exploitative and support functions toward the innovation activities as well. The issue of alignment of explorative and exploitative functions should be taken up in annual or periodic strategic planning workshops to plan the alignment of all involved functions in order to execute the innovation strategy effectively and efficiently. In, yet, another intervention, the innovation work unit should understand the capability of the production lines and design products accordingly, so as not to impose drastic changes in the production process, or in other words—the makeability of the product design.

5.5.3 Ambidextrous Strategic Management

First and foremost, iHPOs must craft out ambidextrous strategies, vision, mission and corporate value to direct the focus on both exploration and exploitation and communicate them organization-wide. Organizations must demonstrate this practice in their organization to focus organizational efforts for innovation for the long-term, and performance and efficiency for the short-term. These strategic messages are to be communicated in all the company artifacts, publicly announced on the Internet, and internal bulletin boards; and to be taken up for review in the annual strategic planning. Strategic directions, objectives and end business result that are expected from doing an innovation must be clearly set to delineate the scope of work and the way forward to guide the whole troop to move in the same direction without going astray, which would otherwise waste resources and time, and negatively affect the efficiency of innovation projects; leaders had to provide directions for this. The iHPOs must facilitate and maintain the strategies for ambidexterity by allocating resources for the refinement of

existing technologies, the leveraging of existing competencies, and to the development of new competencies, skills and capabilities, so as to maximize immediate efficiency and reliability, and overcoming the future risk of becoming obsolete.

5.5.4 Scenario Planning

It is quite impossible to exactly specify up-front what would actually be derived at the end of an innovation project because innovation is believed to be an iterative process that cannot be entirely planned out in advance but needs adjustments along the way. Though organizations cannot directly manage innovativeness, they can manage the environment to set the stage for it. Despite all the above-mentioned beliefs, the findings suggested that iHPOs do not leave innovation project completely to chance, but instead employ scenario planning as a tool to look into the future to simulate what might possibly happen or go wrong in an innovation project. Even though innovation must be implemented through experiments and trial-and-error approach, there are benefits in up-front detailed scenario planning to simulate all possible scenarios of a project so as to minimize unanticipated surprises. This would reduce unexpected bumps along the way of an innovation project and enhances the efficiency in the resource utilization without unnecessary waste. Scenario planning is, thus, rightly recommended as one of the management tools for ambidextrous organizations.

5.5.5 Performance Management Systems

The findings showed that various organizations have performance management systems in place, setting KPIs for all sorts of performance including those for productivity, collaboration, innovativeness. Performance management system is an effective tool in bringing out the best performance from employees. And it is never an overstatement to claim that every organization has a performance management system to achieve important objectives in human resource management, such as motivating individual performance, assisting employees to develop their competencies, enhancing performance culture, and contributing to business strategy implementation. Performance management system also has a positive correlation with innovation. Therefore, it is plausible that several companies in the study had performance

management systems in place to manage for both efficiency and innovation simultaneously.

5.5.6 Talent Management System

The study findings clearly indicated that a large number of participating companies had a talent management system aimed at developing or retaining high performance and high potential employees in both the innovation-driven and efficiency-driven work units, even if that meant they had to pay more for these talent employees. Talent management system is a human resource management tool used to identify high potential and high performing employees, to deploy them in critical positions and to support them with a differentiated HR practice. In contrast to managing talent for high performance, companies also need to become innovative, and in order to do so, have to manage their talents well. Therefore, apart from the performance talent management systems normally utilized in organizations, an innovation talent management system are also recommended for the grooming of innovation talents or champions. This could start out by having each work unit nominate its high potential personnel for innovation and put them through innovation grooming program. For example, in a highly successful program of one case company, the high-potential employees were put through a rigorous training program that lasted for eight months. They learned some creativity and innovation management tools such as TRIZ, which is a systematic methodology that enhances creativity for innovation and inventive problem solving. During the period there were homework assignments, examinations, and a real-world project to finish within 6 months. The company stressed they selected only promising talents to go through this ordeal.

5.5.7 Project Control Procedures and Tools

This theme produced the most categories of antecedent factors of ambidextrous organization. This demonstrated the importance of applying control in innovation projects to enhance the efficiency of innovation management in these companies. These project control procedures and tools include various items as in the following.

- 1) Product Development Management Tools

This refers to the use of management tools for new product development; one of the most mentioned tools is Agile methodology. This is originally a software development methodology created from the needs typical of software industry where iterative process is best suited to the work. Agile methodology calls for very short-term planning and progress review meetings, sometimes even on a daily basis. Three out of five companies in the group of high-tech and IT in the study explicitly indicated they used Agile in their product development process. Compared to the conventional plan-driven project management method, Agile methodology is believed to be more likely to bring about significant improvement in terms of efficiency than the conventional ones.

Another tool suggested for use in innovation management is product life cycle management software. It is suggested for use in new product management process. In order to mitigate the challenges caused by diverse locations of design teams, product variation, and time-to-market pressure, firms should include a product life-cycle management system in new product development projects. This software has significant impact on three dimensions, i.e. product data management, process management, and engineering project management. This is one tool that can be recommended for use in ambidextrous management. Practically the software can track the efficiency of an innovation project along the whole process from inception to the commercialization, providing data for effective decision-making regarding the new product development. It links all related functions to view the same data so as to have the same picture of the progress of the project.

2) Project Termination Mechanism

This refers to the management practices in putting an end to an innovation project in order to stop wasting resources on failing projects. Creating mechanism to identify and terminate failing projects is one of the roles of innovation leadership to maximize efficiency of innovation projects. The termination of deteriorating projects would prevent the escalation in the loss of resources. These practices ensure simultaneous management focus on efficiency and innovation. Project termination mechanism could be conducted via monthly project progress evaluation meetings, or through close project monitoring system, such as the above mentioned product lifecycle management system.

3) Project Management Knowledge and Skills

One company mentioned project management as a management tool to effectively manage all resources utilized in a project, namely, money, materials, machine, manpower and time. This includes the timeline management, budget control, manpower shuffling. Another stressed the importance of project management skills after they learned from a detrimental failure in a project which did not get completed in time and consequently suffered a big delay-fine. These are the capabilities that companies must master in order to execute ambidexterity in the organizations.

4) Collaboration Management

Collaboration is considered one important antecedent of all innovation efforts. In fact, it is one of the four basic shared values of innovative organizations, i.e. bold ambition, collaboration, learning and responsibility. Therefore, any attempts to manage collaboration are by all means necessary for innovation project management. The findings illustrated one tool for this purpose, that is, KPIs for collaboration in an attempt to ensure that staff in all relevant work units pay attention to the issue of collaboration. The utilization of KPIs has been proved to affect process-innovation related performance; and is also confirmed to have positive correlation between performance management systems (which includes KPIs) and corporate innovation and performance.

This concept is corroborated by the findings from this study which illustrated one incident of inter-departmental collaboration management in which KPIs were set for prompt response to request for raw material for experiments of innovation project. Another case featured KPIs for sales department to push new innovation solutions into the market. These are some recommendable examples of how to utilize KPIs for collaboration management.

5) Quality Management

Innovation-centric organizations or especially the IT or technology related startups normally focus on the innovation dimension of an application or new product, overlooking the quality issues of the new product. The findings revealed that this may lead to a speedy launch of the innovation, only at the expense of defects cropping up in the finished product causing dissatisfaction from customers. Quality is considered a significant element of competitive advantage and an element related to

exploitative activities because it requires rule adherence, rather than rule breaking. On the one hand, scholars stressed the importance of effective quality control procedures in an innovation project; on the other hand, it is indicated that quality management is also an antecedent of ambidexterity. Thus, in order to achieve both explorative and exploitative objectives, it is recommended that iHPOs focus on both quality and innovativeness in any innovation projects.

One recommendable approach revealed in the findings is for innovation projects to spend significant time on quality management issue. Case in point, an IT/high-tech company followed the Japanese software development practice of allotting 50% of project time to quality issues, contrasting with only 25% on the development of the IT/high-tech product.

6) Project Feasibility Screening

In a strategic decision making on new product development, companies have to make a choice of what project to invest and what not. Organizations always have to objectively consider the possibility of success and the return on investment of an innovation project. This is done up-front before the decision to go or not to go with the innovation proposal. Feasibility study has long been one of the four criteria in the decision making process along with the other three elements, namely, the business opportunity, the competitiveness, and the leverage opportunities provided by the strategic option. It has been strongly signified that committing resources to up-front screening of new projects is a critical factor for successful industrial innovation management. The findings illustrate some recommendable practical criteria for the selection of innovation projects, such as, creative initiative, difficulty to duplicate by competitors, quality, novelty; market trend; market size; market share; return on investment; value for customers, benefits for stakeholder and the country; competitive price and cost; production capacity or readiness, the chance of success. After careful criteria screening, another good recommendation for the practice is for companies to make a demo product to gauge the responses from customers.

5.5.8 Separation of Knowledge Focus

The knowledge in ambidexterity-related realm is classified as exploitation-oriented and exploration-oriented. Exploitation pertains to making use of existing knowledge; while exploration involves creating new knowledge. The R&D frontline people normally have in-depth expertise in their disciplines, which is exploitative in nature, but often lack the big picture perspectives; while management have a bird's eye view of various fields of knowledge, which is explorative in nature and is complementary to the in-depth expertise of team members. This is informed by a number of beliefs that radical innovations require new knowledge or departure from existing knowledge and technology; and involve searching for new organizational routines, experimentation, risk-taking and discovery of new approaches to technologies, products, businesses, and processes. Radical innovations result in new designs, create new markets, and develop new channels of distribution. At the same time incremental innovations utilize and refine existing capabilities, knowledge, processes and operate in the current organizational structures and focus on existing activities in the current domains. Therefore, frontline people who possess in-depth skill tend to focus on the incremental innovation while leaders who are in the bird's eye view perspective are more oriented towards radical innovation. Hence, it is recommendable for organizations to assign different knowledge focus to different levels, that is, functional expertise focus to the frontline staff and big picture perspective skills to the management level, in order to plan the HRD and HRM activities, accordingly.

5.5.9 Ambidextrous leadership

The recommendation for practice is discussed in three dimensions:

1) Leadership roles

These findings point to the type of leadership that have to focus his/her management on innovation and corporate performance simultaneously; or in other words they have to be ambidextrous leaders. The recommendation is for leaders to manage tension between exploration and exploitation on a continuous basis. They must be skillful in juggling the innovation activities and enhancing efficiency at the same time. Innovation requires visionary and empowering leadership and the ability to focus on the business performance, and the concentration on the business side of the projects

on hand. They must aim at creating new innovation, new products, and new service; at the same time, they must also care for growth, profit, stock price, brand reputation, and other performance indicators.

2) Management by Committee

The findings illustrated the use of management by committee in iHPOs in the study. Apparently, because a committee is composed of various members, the resulting diversity of expertise and experience represented by the disparate committee members enhances effectiveness of the management by committee. The findings revealed several companies utilized committees in various transactions, such as in evaluating the feasibility of new project proposals; evaluation of on-going projects in making decision to proceed or to terminate the projects; and solving conflicts arising from cross-functional innovation project teams, etc.

Despite the diversity of the committee, efforts must be made to create and maintain the integration and cohesiveness of the committee, which will enable exceptional group performance. This integration is made possible by the close coordination and communication, and, at times, socialization of the team members.

3) Key Individuals Facilitating Innovation

Effective innovation projects need key individuals to champion the projects. One group of these individuals are the promoters, and champions (i.e. persons who fully support an idea, project, or product, and put efforts to force the idea through any resistance and will evangelize it throughout the organization, also called idea champion change advocate, change agent). Another group of key individuals are gatekeepers (i.e. retriever and disseminator of knowledge and information); and the third group of key individuals are those in the boundary spanning role i.e. getting in touch and communicating with external players. These roles are an important part in promoting innovation and enhance efficiency of the innovation projects and are worthy of recommendations for companies vying to be iHPOs.

5.6 Recommendation for Future Research

Further research could be conducted in the future with more sample companies from each industry and with more companies in the same size range so as to better compare the findings among peer groups. Issues of exploitative nature in more explorative organizations, and vice versa, should be explored in depth, in order to discover typical challenges and solutions in each type of company.

Quantitative research can also be beneficial if enough innovative and high-performance companies can be recruited to participate in the survey. Anyhow, qualitative research in this field has a long way to go, since the research done in Thai context are still very limited. More qualitative research can also add depth to the body of knowledge of organizational ambidexterity in Thailand.

Lastly, the issue of paradoxes could be explored more rigorously. Answers for paradoxes of ambidexterity are not always straight forward, thus reframing the interview questions in various perspectives could help in eliciting the answers in various dimensions which would yield healthy data for analysis.

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APPENDICES

Appendix A

Semi-Structured Interview Protocol and Interview Questions

This interview protocol and interview questions are designed based on the research questions as follows:

- 1) What are the structure, context, culture that enhance innovation in (officially recognized) innovative and high-performance listed companies?
- 2) How do these organizations enhance efficiency?
- 3) What are the paradoxes encountered and overcome in achieving both innovativeness and efficiency (ambidexterity)?
- 4) How do these organizations manage the paradoxes of these two dimensions (innovation and efficiency)?
- 5) What is a possible ambidextrous model of innovative high-performance organizations in Thailand?

The semi-interview will be constructed to probe these main points:

- 1) Perceived meaning of innovation and efficiency in the organizations.
- 2) Participant's experience and involvement with innovation projects and activities.
- 3) What encourage and what discourage innovation (RQ 1).
- 4) What paradoxes/contradictions arise between innovation and efficiency and how they are solved (RQ 2+3).
- 5) Suggestions for the solutions for the paradoxes yet unsolved (RQ 2+3).

The interview protocol and interview questions:

The interview protocol as follows:

- 1) Welcoming the participant and self-introduction: Greeting and self-introduction.

2) Thanking the participant: Thank you for your participation in this interview.

3) Introducing and elaborating about the interview topic: Management and Leadership of Innovation and Ambidexterity in the Innovative High-performance Enterprises in Thailand.

4) Informing the participant of the objectives and significance of this study:

(1) To find what leads to innovation; what difficulty hinders innovation, how managing innovation conflicts with managing efficiency/productivity; how the paradoxes were solved; what suggestions for solutions of the paradoxes yet unsolved.

(2) The findings from this research would give a conceptual framework of antecedents enabling management of the paradox of innovation and efficiency (productivity)

(3) This research aims to derive guiding concepts for innovative organizations, on the one hand, and high-performance organizations, on the other hand, to build up ambidextrous capacity for both innovativeness and efficiency simultaneously.

5) Informing the benefits for participants:

(1) An opportunity to contribute to the body of knowledge of innovation and its paradox management which will benefit our country as a whole.

(2) The findings from the research will be formulated from data obtained from this interview and other interviews, thus, the final conclusions might be relevant and of interest to the participant's organization. The research findings will be shared with the participants if so required

6) Informing the confidentiality of the interview:

(1) Participants' identity and remarks during the interviews will be kept confidential and not disclosed to a third person. All information obtained from this interview will be used for this study only.

(2) The research will summarize the information from the interviews, with some direct quotations where necessary. However, names or clues leading to the identification of the participants will not be disclosed by any means.

(3) Participants have the right to refuse any questions that they do not feel comfortable to answer.

7) Asking for Permission for Voice Recording: Ask participant for permission to record an interview for data analysis purpose.

8) Informing the Duration of the interview: This interview will take approximately 60 minutes.

The interview questions are:

- 1) What is innovation to you? What does it mean?
- 2) What are the examples of innovations in your organization you can think of?
- 3) What is your role in regard to innovation in your organization?
- 4) What are the innovation projects or activities you have been involved in?
- 5) On the scale of 1-10, how innovative is your organization? Why the rating?
- 6) What are the factors that enhance innovativeness/innovation in your organization?
- 7) What are the factors that hinder innovativeness/innovation in your organization?
- 8) What were the obstacles/difficulty/challenges/paradox encountered in the attempt to manage both innovation/innovativeness and efficiency/performance?
- 9) How were they solved?
- 10) What are the issues which are still unsolved?
- 11) Why are they unsolved?
- 12) What is required in solving the problems? What are the solutions to the problems?
- 13) Any other contradictions encountered in managing for innovation and managing for efficiency/performance?
- 14) How were they solved?
- 15) Any other ideas you want to share?

The ending of the interview is as follows:

- 1) Asking for permission to follow up:

If there is any further inquiry, the researcher may ask for your permission to gather more information at your convenience.

2) Expressing of appreciation :

I would like to express my sincere thanks to you for all your information, and suggestions. These will be put into good use and will eventually be part of this research findings which will contribute to strengthen innovativeness and innovation in our country.

Appendix B

Frequency Counts of Meaningful Expressions of Antecedent Factors of Innovation

Table B Frequency Counts of Meaningful Expressions of Antecedent Factors of Innovation

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
Theme 1: Structure																			
	Flat structure	Flat structure			1	1	1	1	1			1			1	1	1	9	60.0
	Cross-functional project teams	Cross-functional project teams	1		1	1	1		1			1	1	1	1	1	1	11	73.3
	Internal spatial separation of structure	Internal spatial separation of structure	1	1	1	1	1	1	1	1	1	1			1			11	73.3
Theme 2: System-process-tool																			
	Mechanism/tool for idea generation	Specialized idea generation methodology/process	1	1			1											3	20.0
	Mechanism/means for motivation to innovate	Innovation contest	1	1	1	1	1					1						6	40.0
		Knowledge sharing session						1									1	2	13.3

Table B (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
		Commercial success of the new products				1											1	2	13.3
		Rewards and recognition for innovation	1	1		1					1							4	26.7
Theme 3: Staff-related elements																			
	Knowledge and skills	Functional expertise		1	1	1	1		1		1		1	1	1	1	1	11	73.3
		Ideation fluency				1	1		1						1		1	5	33.3
		Flexibility, adaptability skills		1			1		1		1							4	26.7
		Good interpersonal skills			1			1	1				1				1	5	33.3
	Attitudes for innovation	Affection for creating new things							1	1						1		3	20.0
		Curiosity, inquisitiveness, passion				1	1		1						1			4	26.7

Table B (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 companies
		Open-mindedness				1					1					1		3	20.0
		Challenging the status quo				1	1		1						1		1	5	33.3
		Achievement orientation				1				1	1			1	1			5	33.3
		Taking responsibility and committed to his/her job						1	1					1	1	1	1	6	40.0
	Learning	Affection for learning		1			1		1						1	1	1	6	40.0
		Self-learning							1		1	1	1			1		5	33.3
		Learning from mistakes		1	1					1				1	1			5	33.3
		Keeping pace with the latest technology				1		1	1			1	1	1	1	1	1	9	60.0
Theme 4: HRD and HRM																			
	Learning & development	Coaching			1				1							1		3	20.0
		Job rotation				1											1	2	13.3

Table B (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
		Technological competency development				1			1						1			3	20.0
		Development of communication and socialization skills				1									1			2	13.3
		Development of creativity skills		1			1											2	13.3
	Effective talent recruitment practices	Competency based recruitment							1				1				1	3	20.0
Theme 5: Leadership																			
	Showing support for innovation	Showing support for innovation	1		1		1		1		1		1		1			7	46.7
	Emphasis on teamwork	Nurturing teamwork, trust and collaboration					1	1	1				1	1			1	6	40.0
	Showing passion and/or involvement in innovation	Showing passion and/or involvement in innovation	1		1	1	1		1	1	1		1	1	1	1	1	12	80.0

Table B (Continued)

Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
Pragmatism	Action-oriented and result-driven leadership					1		1									2	13.3
	Evidence-based judgement	1			1				1		1			1			5	33.3
Risk taking	Risk-taking			1		1					1		1	1			5	33.3
	Tolerance for failures					1		1	1								3	20.0
Openness	Being accessible to team members					1		1	1					1		1	5	33.3
	Open-mindedness					1	1		1			1	1			1	6	40.0
Competencies	Being visionary and communicating the vision	1		1		1					1		1	1	1		7	46.7
	Good networking	1						1						1	1		4	26.7
	Adaptability to changes in task environment	1			1				1	1	1		1				6	40.0
	Empowering				1	1	1	1							1	1	6	40.0
Cognitive ability	Having broad perspectives		1			1									1		3	20.0

Table B (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
		Awareness of the latest business trends										1		1	1	1	1	5	33.3
	Transformational leadership	Inspirational stimulation, being visionary	1		1		1					1		1	1			6	40.0
		Challenging followers intellectually														1		1	6.7
		Individualized consideration for followers							1									1	6.7
		Influencing and persuasion							1									1	6.7
	Key facilitators for innovation	Innovation champion	1	1				1				1						4	26.7
		Boundary spanning function		1			1											2	13.3
		Gatekeeper function				1						1						2	13.3

Table B (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
Theme 6: Climate and culture																			
	Psychological safety	Freedom to express ideas, debate.					1	1		1			1			1	1	6	40.0
	Diversity	Including various functions in teams				1	1		1									3	20.0
	Organizational support	Support for opportunities and resources	1	1	1	1	1	1	1			1	1	1	1	1	1	13	86.7
	Collaboration atmosphere	Breaking down silos,		1								1				1		3	20.0
		Good co-ordination between functions		1	1		1	1		1		1		1				7	46.7
	Information sharing	Frequent meetings				1											1	2	13.3
	Innovation culture	Organization-wide participation		1									1	1				3	20.0
	Team orientation	Showing trust in followers					1			1						1	1	4	26.7
		Helping out other members							1				1		1			3	20.0

Table B (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
	Workplace	Friendly atmosphere					1		1	1			1					4	26.7
		Open space and modern looking work surrounding					1					1					1	3	20.0
	Experiment-orientation	Experiment-orientation, trial and error		1		1		1		1	1					1		6	40.0
	Corporate strategy and shared value	Innovation as strategy/core- value	1	1	1	1	1		1		1			1				8	53.3
Theme 7: Knowledge sources																			
	Sources of innovation	Ideas from people of all ranks		1					1						1			3	20.0
		Adoption of external innovation		1				1	1									3	20.0
		Joint innovation with external parties	1		1	1	1					1						5	33.3
	Sources of knowledge	Lesson learned from mistakes		1							1				1			3	20.0

Table B (Continued)

Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
	New knowledge gained from R&D			1	1	1		1		1							5	33.3
	Searching for knowledge from Internet, research papers and exhibitions.						1		1			1	1			1	5	33.3
	Learning and sharing session					1	1	1						1			4	26.7
	Training or taking innovation courses	1	1		1			1				1	1	1	1		8	53.3
	Learning from alliances		1					1			1			1	1	1	6	40.0
	External site visit	1				1											2	13.3
	Knowledge management systems		1		1					1		1			1		5	33.3

Table B (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies	
Theme 8: Environmental elements																				
	Customer and market-orientation	Customer insight and market intelligence	1		1	1		1	1	1		1					1	1	9	60.0
	External triggers for innovation	Competition in the market		1		1			1										3	20.0
		Short product life cycle		1				1											2	13.3
		Laws and regulations		1	1														2	13.3
		Social trends	1		1														2	13.3
		Technological changes		1		1		1				1	1	1	1	1	1		9	60.0

Appendix C

Frequency Counts of Meaningful Expressions of Paradoxes of Innovation

Table C Frequency Counts of Meaningful Expressions of Paradoxes of Innovation

Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 companies
Theme 1: Paradox of Cross-Functional Collaboration and Own Performance																		
Paradox caused by lack of collaboration	Paradox caused by lack of cooperation from other functions	1				1											2	13.3
Solutions to lack of collaboration	Setting KPI for collaboration					1											1	6.7
	Integrated and cohesive cross-functional leadership teams		1														1	6.7
	Alignment of relevant functions					1				1	1						3	20.0
	Management calling for collaboration					1											1	6.7
	Enhancing communication and socialization					1											1	6.7

Table C (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 companies
Theme 2: Paradoxes of Explorative and Exploitative Activities																			
	Paradox caused by cost control	Paradox caused by cost control in innovation projects		1														1	6.7
	Paradox caused by demands for speed	Paradox caused by demands for speedy completion of innovation projects		1							1				1			3	20.0
	Solutions to cost control in innovation projects	Assigning cost-conscious persons to manage cost control		1														1	6.7
	Solutions to demands for speed	Investment for abundant facilities									1					1		2	13.3
		Simplification of processes		1														1	6.7

Table C (Continued)

Categories		Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 companies
Theme 3: Paradox of Individual vs. Team Creativity																			
Paradox caused by lack of interpersonal skills	Paradox caused by lack of interpersonal skills					1			1									2	13.3
Solutions to balancing individual vs. team focus	Team brainstorming on individual's initiative ideas								1								1	2	13.3
	Team efforts in idea implementation							1	1			1						3	20.0
Theme 4: Paradox of Change and Continuity																			
Paradox caused by resistance to change	Paradox caused by resistance to change				1			1				1						3	20.0
Solutions to resistance to change	Getting everyone exposed to innovation						1	1				1						3	20.0

Table C (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 companies
Theme 5: Paradoxes of Resource Insufficiency																			
	Paradox caused by insufficient resources	Paradox caused by insufficient resources							1									1	6.7
	Paradox caused by time pressure	Paradox caused by time pressure					1		1									2	13.3
	Paradox caused by workload pressure	Paradox caused by heavy workload					1		1									2	13.3
	Solutions to paradox of resource allocation	Reshuffling manpower							1									1	6.7

Table C (Continued)

Categories		Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 companies
Theme 6: Paradoxes of Learning																			
Paradox caused by lack of new knowledge and know how	Paradox caused by lack of new knowledge and know how								1									1	6.7
Solutions to paradox of explorative vs. exploitative knowledge	Job rotation				1													1	6.7
	Hiring new competency					1	1				1							3	20.0
	Separation of functional expertise and big picture perspective skills		1		1											1		3	20.0

Appendix D

Frequency Counts of Meaningful Expressions of Antecedent Factors of Ambidexterity

Table D Frequency Counts of Meaningful Expressions of Antecedent Factors of Ambidexterity

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
Theme 1: Structure																			
	Spatial separation	Separating work unit for innovation	1	1	1	1	1	1	1	1	1	1			1			11	73.3
	Alignment of relevant functions	Alignment of the value chain and supportive functions					1				1							2	13.3
Theme 2: Strategic Management																			
	Strategy for innovation	Setting directions for innovation	1			1	1		1				1			1	1	7	46.7
	Ambidextrous strategy	Focusing corporate strategy on innovation and efficiency	1	1	1	1	1	1			1	1	1		1		1	11	73.3
	Annual goal setting and planning	Annual goal setting and planning		1			1											2	13.3
	Planning process	Thorough scenario planning		1														1	6.7

Table D (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
Theme 3: Systems																			
	Innovation talent management system	Innovation talent management system		1				1				1						3	20.0
	Performance management system	Performance management system			1		1						1					3	20.0
Theme 4: Project Control Procedures																			
	Product development management tools	Agile methodology												1			1	2	13.3
		Product lifecycle management software		1														1	6.7
	Project termination mechanism	Termination of unviable projects				1	1				1							3	20.0

Table D (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
	Project resource management	Reshuffling resources and priority		1		1					1							3	20.0
		Budget control			1				1	1					1			4	26.7
		Timeline control					1			1	1			1	1		1	6	40.0
		Regular appraisal of project progress					1						1					2	13.3
	Collaboration management	Setting KPIs for collaboration									1	1						2	13.3
	Quality management	Quality control in every innovation stage			1										1		1	3	20.0
	Project feasibility screening	Up-front project feasibility screening	1	1		1	1	1		1							1	7	46.7

Table D (Continued)

	Categories	Codes	1-CA	1-CB	1-SA	1-SB	1-TA	2-SL	2-NN	2-PR	2-UI	2-DE	3-GG	3-LL	3-IN	3-JJ	3-DI	Total Counts by Companies	% of 15 Companies
Theme 5: Leadership																			
	Ambidextrous leadership	Focus on both innovation and business performance	1												1			2	
	Leadership team	Management by committee		1	1	1	1	1										5	33.3
		Integration and cohesiveness of innovation management team		1	1	1		1										4	26.7
Theme 6: Knowledge																			
	Separation of knowledge focus	Separation of functional expertise and big picture perspective skills		1		1										1		3	20.0

BIOGRAPHY

NAME

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ACADEMIC BACKGROUND

Bachelor's Degree with a major in English from Ramkhamhaeng University, Bangkok, Thailand in 2006 and Master of Science Degree with a major in Organization Development from National Institute of Development Administration (NIDA), Bangkok, Thailand in 2012

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