A RESOURCE-BASED VIEW OF THE COMPETITIVENESS OF DESIGN FIRMS IN SINGAPORE

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by

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Certificate of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Charles Sturt University or any other educational institution, except where due acknowledgment is made in the thesis. Any contribution made to the research by colleagues with whom I have worked at Charles Sturt University or elsewhere during my candidature is fully acknowledged.

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Abstract

Design firms are knowledge-intensive service firms where knowledge assets drive service outputs which are delivered by knowledge workers who embody these assets. Whilst the firm’s knowledge base is a valuable resource, it is only when this valuable knowledge is bundled with appropriate cognitive and learning processes can a design firm build competitiveness. Using qualitative, case-based methodologies, the current research focuses on understanding the impact of managerial cognition on the reconfigurations of a firm’s resource base in Singapore at a time of rapid socioeconomic shifts. The core research question asked: How do changes in the external environment influence managerial cognition and the firm’s ability to learn, assemble and modify its resources and capabilities? The aim was to identify instances of cognitive framing, and examine their connections with the different managerial actions taken to assemble or modify capabilities. To this end, the literature on the resource-based theory of the firm (RBT), dynamic capabilities (DC), learning and managerial cognition were the theoretical lenses with which to ground the focus of the study. Although the literature argues that managerial cognition enables learning which in turn renews and modifies a firm’s resource base, we have a limited understanding of how the knowledge accrued from a firm’s competitive activities is absorbed into the firm’s existing resource base and what the resulting changes subsequent to these cognitive, learning experiences are. Advances in the RBT and DC constructs propose theoretical relationships between managerial cognition and the assembly and/or modification of the firm’s resource base components. The
The current study posits that these relationships may explain the impact that managerial cognition has on the firm’s resource base renewal process, as it relates to the how a firm responds to environmental challenges and make subsequent changes to its dynamic and operational capabilities. However, these relationships remain unexplored within the context of the design industry in Singapore. Thus the aim of the study was to learn more about managerial cognition and how they impact strategic decision-making and capability assembly in Singapore’s design firms.

The study demonstrated that managerial cognition, learning and experience are implicit to the assembly of dynamic capabilities. The study suggests that the iterative use of similar cognitive behavior to change organizational processes leads to the encoding of experience and learning into the firm’s managerial cognition which, in turn leads to the assembly of dynamic capabilities. The study finds that managerial cognition of capability purpose and capability salience are important precursors to the assembly of capabilities and managers’ past experiences are critical to the strategic choice. If managers are able to develop managerial cognition of capability purpose and capability salience as necessary components of their managerial capability, it will enable them to purposefully act to interpret the environment in new ways, assemble the necessary capabilities to match those opportunities and thereby, build firm competitiveness.

The study found no formally codified cognitive routines or specific R&D within firms; they often emerged or evolved in response to the managerial cognition and leadership of the founder and/or managerial teams. Changes brought about by firms resulted primarily from processes that relied on the managing partners’
cognition and vision, which is consistent with the literature on managerial cognition. The research suggests that firms should focus on the cognition of core attributes that will improve their responses to environmental uncertainties. To this end, networking is a crucial activity that supports this cognition. Firms should dedicate resources to build enduring client relationships, design innovation, managerial cognitive capability and reputation that will support their firm-specific strategies in the marketplace.
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CHAPTER ONE

INTRODUCTION, PROBLEMS AND OBJECTIVES

1.0 Background to the Research

An overarching issue in strategy research is the understanding of firm competitiveness or persistent performance heterogeneity among firms (Porter, 1991; Mehra, 1996; McGrath, et al, 1996). For years the dominant view, derived from the industrial organization (IO) theory framework, explained superior performance through structural features of industries, such as barriers to competition (Porter, 1980; Galbreath, 2005). First articulated by Mason (1939), developed by Bain (1956, 1959), and applied by Porter (1980, 1981), this view holds that industry characteristics explain much of the variance in firm performance, and it is through the manipulation of industry variables that managers can attempt to improve their firm’s competitive advantage. The IO framework ignores the importance of intra-industry heterogeneity, arguing that superior performance depends on the firm’s membership in an industry that has an attractive structure relative to other industries (Phillips, 1974; Caves and Porter, 1977).

However, the failure of the IO framework to explain why some firms are continually more successful than others within any given industry, regardless of whether the average profitability of the industry is high or low (Bharadwaj et al., 1993), and the scarcity of compelling empirical evidence to support industry structure as the key driver of firm competitiveness, have fueled the rise of the resource-based theory of the firm (RBT) as the leading explanation for firm competitiveness (Foss, 1998). First theorized by Wernerfelt (1984), extended by
Rumelt (1984) and Barney (1986), but drawing on the earlier seminal work of Penrose (1959), the RBV postulates that persistent inter-firm performance dispersions are attributed to heterogeneous resource endowments held by firms and it is the failure of competitors to replicate, acquire or substitute for these resources that makes for sustained performance advantages (Peteraf, 1993).

The RBT gained considerable traction in the 1990s and 2000s, as strategy theorists shifted their attention on the firm from building market power through manipulation of industry structure towards leveraging resources to compete within a given industry, regardless of the industry’s attractiveness (Whittington, 1993). The RBT prescribes that resources are important factors of a firm’s competitiveness only if they meet the VRIN test of value, rareness, inimitability, and non-substitutability (Barney, 1991). A resource must be valuable, which is the capacity to capitalize on opportunities and/or neutralize competitive threats, be rare among the firms’ competitors. be resistant to replication and must not have substitutes (Barney, 1991). Additionally, the underlying core assumptions of the RBT maintain that firms are heterogeneous amalgamations of resources, subject to the constraints of imperfect resource mobility (Barney, 1986; Dierickx and Cool, 1989; Oliver, 1997).

Barney, Ketchen and Wright (2011: 1299) acknowledge that the RBT has evolved from a fledgling perspective on strategy since 1991 into “one of the most prominent and powerful theories for describing, explaining, and predicting organizational relationships” and reached a level of maturity marked by the cultivation of multiple “spin-off perspectives”, particularly the knowledge-based view (Grant, 1996) and dynamic capabilities (Teece, Pisano, & Shuen, 1997), the
integration of RBT's insights with those of other perspectives (Oliver, 1997; Combs & Ketchen, 1999), and critical assessments of the critiques of the collective body of RBT work to date (Kraaijenbrink, Spender, & Groen, 2010).

While based primarily in an economic paradigm (Conner, 1991), the RBT aims to address the shortcomings of the I/O model by focusing on competitive advantage as it arises from heterogeneous resources and capabilities in the firm (Foss, 2007; Jarzabkowski, 2008). The RBT views competitive advantage as arising not only from tangible assets, but also socially complex assets, such as culture, knowledge, capabilities embodied in specific actors, and the learning routines of an organization (Barney, 1991). It thus addresses some of the concerns of the practice field by attempting to reinstate actors and unique or situated action into strategy research (Jarzabkowski & Balogun, 2009; Jarzabkowski & Whittington, 2008; Jarzabkowski, 2008).

However, the RBT tends to fall short of its ambitions to explain how heterogeneity within firms is associated with differences in firm performance, resorting to positivistic methods that are too coarse to access deep understandings of how firms differ and, indeed, what difference that makes (Rouse and Daellenbach, 1999). Consequently, unique attributes that might make a difference, such as the influence of managerial cognition and actions, are left within the ‘black box’, failing to address the very problem that the RBT raises (Jarzabkowski, 2008; Priem and Butler, 2001).
Dynamic capabilities represent an evolutionary development on the RBT, being in the same broad family of theory, but aiming to go beyond the criticisms of the RBT as excessively static (e.g. Simon, Hitt and Ireland, 2007; Teece, 2007; Scarbrough, 1998; Spender, 1996). There is a growing consensus that differences in firm competitiveness are driven by cognition and higher-order capabilities to assemble or reconfigure bundles of resources that will generate value over time (Teece, Pisano, & Shuen, 1997; Winter, 2003; Eggers & Kaplan, 2013).

Like the RBT, dynamic capabilities focus on core issues such as competencies and firm performance, of longstanding importance in the field of strategic management (Easterby-Smith et al, 2009). In contrast to the RBT, however, its emphasis is on dynamics. This allows it to be disassociated from criticisms as a static and equilibrium-based model (e.g. Simon, Hitt and Ireland, 2007; Teece, 2007), thus broadening its appeal. Thus, dynamic capabilities lends value to the RBT arguments as they transform what is essentially a static view into one that can encompass competitive advantage in a dynamic context (Ambrosini et al., 2009; Barney, 2001a, 2001b).

Rather than conceiving of resources as something a firm has that gives it unique advantage, dynamic capabilities are concerned with the learning processes that a firm does. This is a distinctive contribution from a practice perspective, since it acknowledges more dynamic forms of theorizing. However, despite considerable research, dynamic capabilities still fail to deliver a coherent account of strategy-making: how capabilities are assembled and modified over time and what difference that makes to the strategy of the firm (Cockburn et al., 2000). This may be because capability-building theory has also been dominated by positivistic
traditions in strategy research and so lacks adequate fine-grained analysis to furnish a more dynamic theory of dynamic capabilities (Regné, 2005; Jarzabkowski, 2008).

A practice focus can address these shortcomings in RBT and dynamic capability theory by providing a more micro-focus on those managerial activities and actions from which socially complex resources are constituted (Jarzabkowski, 2008; Johnson et al., 2003). Barney, et al (2011) assert that in addition to understanding how resources are acquired or developed, the process of resource and capability development also involves a need to examine the paths and sequences of their evolution. Most importantly, because it is concerned with a cognitive view of managerial action, a practice perspective can shed light on the way capabilities emerge, are assembled, modified and changed over time, building our understanding of the essence of dynamic capabilities.

1.1 Introduction to the Research Problem

Recent research suggest that routines and capabilities are based in particular understandings about how things should be done, that the value of these capabilities is subject to interpretation, and that even the presence of capabilities may be useless without managerial interpretations of their match to the environment (e.g. Eggers and Kaplan, 2013; Benner & Tripsas, 2012; Gavetti, 2005). Recognizing that strategies for the deployment of capabilities are conceived of and implemented by managers, researchers began to focus on the cognition of managers and the interpretive processes in which they engage (Benner & Tripsas, 2012; Eggers & Kaplan, 2009; Gavetti, 2005; Kunc &
Morecroft, 2010). Their studies suggest that managerial cognition is critical to the creation, assembly and deployment of firm capabilities (Eggers and Kaplan, 2013; Gavetti, 2005; Kaplan and Tripsas, 2008; Porac, Thomas, Benner & Tripsas, 2012; Eggers & Kaplan, 2009; Gavetti, 2005; Kunc & Morecroft, 2010). There is substantial evidence that managerial cognition influence decision making through managers’ efforts to match strategic choices to their understanding of the business environment (Barr, Stimpert, and Huff, 1992; Porac et al., 1995; Tripsas and Gavetti, 2000). There is limited empirical evidence, however, for the link between managerial cognition and the actions that managers take to assemble routines into capabilities. Advancing our knowledge about the relationship between managerial cognition and the assembly of capabilities is important because there are strong beliefs within the strategic management field that managers who have a richer understanding about the dynamics of the firm and organizational capabilities will improve the performance of their firms (Cockburn, Henderson, and Stern, 2000). Although recent research on resource orchestration suggests that managerial decisions about the deployment of assets plays a role in creating competitive advantage (Sirmon, Hitt, Ireland, & Gilbert, 2011), it neglects the cognitive dynamics that are important.

Fahy (2000) highlights that as heterogeneous resources contribute in different ways to a firm’s competitive advantage, managers play a crucial role in planning and determining effective resources assembly and deployment. Since managerial perceptions drive a firm’s strategy (Powell, Lovallo and Carnigal, 2005; Mezias & Starbuck, 2003; Winter, 2003), it is necessary to ascertain in the current research how and to what extent they will impact the nature and aggressiveness of the strategic goals of the firms, the markets in which the firms operate, how they
compete, and what activities they will focus on. There are considerable differences in how various managers at a firm perceive, experience, or deal with these managerial issues and conflicts in managerial cognition will inevitable have considerable implications on firm performance (Calori, Johnson & Sarnin, 1994). Misaligned goals between top management and managers involved in the day-to-day process of identifying, acquiring and leveraging resources may result in the implementation of firm decisions that are inconsistent with the firm’s strategy, or may cause a failure to invest in the appropriate resources necessary to sustain performance advantages (Mosakowski, 1997). As Hambrick and Mason (1984) note, strategies are abstractions in the managers’ minds and are reflective of their own personal values and bias. Hence, managers develop cognitive models that establish reference points or benchmarks in order to define their own strategic actions (Powell, et al., 2006; Porac, et al., 1995; Fiegenbaum, Hart and Schendel, 1996). Thus, managers may sometimes, given their own belief systems, be predisposed to invest in the development of a particular organizational culture that may not necessarily fit with or directly contribute to firm profitability.

Hence, what counts is the perceived environment and perceived resources (Crotty, 1998; Weick, 1979), and that managers’ perceptions are crucial determinants of the decisions to assemble and deploy dynamic capability (Adner and Helfat, 2003; Ambrosini et al., 2009). Helfat et al. (2007a, p. 20) assert that that managers ‘have particular importance for dynamic capabilities’ and that to fully understand dynamic capabilities we need to consider what they perceive and act upon in terms of their environment and resources.
Although there is no consensus on a model to explain the process of generating dynamic capabilities, organizational learning is largely seen as the foundation for dynamic capabilities (Ambrosini et al., 2009; Bierly and Chakrabarti, 1996; Grant, 1996; Nielsen, 2006; Paoli and Prencipe, 2003; Zollo and Winter, 2002). Zollo and Winter (2002) propose a set of learning mechanisms that enable the generation of dynamic capabilities, develop the learning needed to understand the environmental circumstances and to change organizational routines. These mechanisms are experience accumulation, knowledge articulation, and knowledge codification. The fundamental role of the learning mechanisms is to modify existing knowledge to adapt the organization to its competitive environment (Chen et al., 2010; Li and Tsai, 2009).

Many scholars highlight the key role managers play in adaptation processes and argue that the assembly of dynamic capabilities successfully depends on the commitment and skills of managers (Ambrosini and Bowman, 2009; Rosenbloom, 2000; Eisenhardt and Martin, 2000; Helfat et al., 2007; Tripsas and Gavetti, 2002). Rosenbloom (2000) stress that managers must first be able to sense changes in the competitive environment in order for them to reconfigure assets to meet new challenges. Thus, the dynamic capability generation process depends on the managers’ ability to identify new strategic opportunities and threats. However, in reality, few managers have the necessary skills to scan the competitive environment, and often, managers fail to perceive environmental conditions in the correct way, resulting in inadequate strategic decisions for adaptation (Ambrosini et al 2009).
Although the literature on dynamic capabilities considers dynamism of the environment to be the major factor in developing dynamic capabilities, managerial cognition is largely perceived as one of the most significant trigger influencing managers to initiate renewal processes. Thus the current study will analyze how managerial cognition influences the assembly and modification of dynamic capabilities. In addressing the gap in our understanding of how managerial cognition guides capability assembly and modifications, the current study will also build on work that has investigated the extent to which managers’ representations of the competitive landscape vary with variation in functional background and experience (Hodgkinson & Johnson, 1994). A growing body of work in the strategy, learning and managerial cognition streams demonstrates that firms can benefit from the careers of their founders and employees (Eggers & Kaplan, 2013; Beckman & Burton, 2008).

1.2 Research context

Most strategy research has focused on traditional industries such as manufacturing, agriculture, food and retail where success is largely determined by maximizing efficiencies in physical and tangible resources such as land, raw materials, machinery, equipment and buildings (Hunt 1997; Makadok, 1999; Galbreath, 2004). This industrial economy was born out of the development of production machinery which transformed economic output from agrarian goods, to manufactured goods (Galbreath, 2004). Fueled by the surge of the digital medium and intellectual property at the turn of the 21st century, the industrial society has transformed into a services economy, where knowledge primarily drives economic growth, fueling the rise in the importance of intangible resources (Canals, 2000; Carmeli and Tishler, 2004). Scholars emphasize that research on the services
industries is crucial because the managerial and organizational issues faced by managers in these industries are also experienced by managers in other industries, where knowledge and creativity are critical to sustaining performance advantages (e.g. Lampel, Lant & Shamsie, 2000). The rise in the service industry worldwide warrants a better understanding of these firms. Researchers have argued that services behave in ways that are different from manufacturing firms, thus rendering results based on samples of manufacturing firms invalid for some service sectors, given their complex nature (Erramilli & D'Souza, 1993; Erramilli, 1990).

Since the early 1980s, scholars have recognized the need to further understand service firms. They are characterized by high knowledge integration and their dependence on human capital, which impact their strategies (Greenwood, Li, Prakash & Deephouse, 2005). As these valuable intangible resources and capabilities are the firm's source of rents, identifying how they are transferred, replicated and modified when faced with uncertainties and environmental shifts may provide an understanding of how these changes impact its resources and capabilities. To date, little has been researched on how environmental shifts cause changes in managerial cognitions which impacts a firm at a resource and capabilities level, a gap we must begin to address to further our understanding of services.

1.3 The design industry in Singapore

In the early 2000s, Singapore’s signing of the various Free Trade Agreements (FTAs) with its neighbors and major trading partners prompted many in the design industry to forecast that the fall in the cross-border protection of professional
services would portend the death of most local small and mid-sized design firms since Singapore’s design needs would come to be dominated by the few big locals, or foreign-owned and multi-national corporations (MNCs), which would crowd out these local firms (Low, 2002). In particular, the freeing up of the trade barriers and protectionism of the local industry have caused a widespread fear that the local firms would not be able to withstand the onslaught of global, scalable firms planting a regional foothold on the island-state, thereby necessitating that local firms either consolidate to defend themselves or fail altogether (Low, 2002).

The following were typical quotes highlighting the concerns in Singapore’s design industry at the time:

“At the rate the [design] industry is shrinking here, it won’t be long before we’d all be working for the foreign companies.” Partner of design firm, Singapore.

“It didn’t matter whether the buyer was a local or foreign company. If there was some sort of offer, shareholders took the money and ran”. Design Director, design firm, Singapore.

The consolidation and intense competition that quickly followed resulted in numerous design firms down-sizing or going into liquidation. To an extent, the failures were not unexpected since the design industry was marred by fragmented, archaic practices with scale inefficiencies protected by regulatory walls, which were eventually dismantled by the FTAs (Low, 2002).

However, by 2007, it became clear that some clusters of the design industry were holding up and some firms were even experiencing rapid growth relative to the industry average (OECD Report, 2007). Many had expanded into foreign markets
and planted footholds in the high-growth, neighboring markets of China, Indonesia, Vietnam, India and the Middle East. Experts in the industry attributed this apparent success to the Singaporean firms’ resources such as nimble workforce, adaptability and resourcefulness—all internal skillsets (The Straits Times, 8 Nov, 2007). However, these explanations were not empirical and were inadequate to account for the Singaporean firms’ success or failure. Moreover, the few studies that were available generally analyzed the phenomenon at the industry-level rather than at the firm-level. Hence, there is a crucial need for firm-level empirical studies to provide guidance for the industry, since many firms had failed, while many of the remaining ones appear lost or unable to grasp the reasons for their own success or failure.

Given the above, the design industry is a compelling context in which to theoretically develop the RBT and DC frameworks due to its reliance on intangible resources that sets it apart from the other traditional industries. The ascendency of the creative industry suggests that some specific intangible resources may be relevant to other industrial firms and studies on firms within the creative industry can help managers to better understand their own resource bundle (Healy, 2002).

Given that design firms rely heavily on mobile and intangible resources often embedded in their human resources, the resources-based theory (RBT), dynamic capabilities (DC), managerial cognition and organizational learning (OL) constructs are appropriate theoretical perspectives to conceptually frame the current study. The theoretical underpinnings of this study are the RBT’s seminal works (Barney, 1991; Peteraf, 1993; Peteraf & Barney, 2003), and the theoretical
advancements in managerial cognition (Eggers & Kaplan, 2013), dynamic capabilities (Eisenhardt & Martin, 2000; Teece, Pisano & Shuen, 1997) and second-order capabilities (Collis, 1994; Winter, 2003). Organizational learning (Cohen & Levinthal, 1990; Crossan, Lane & White, 1999) is reviewed within the scope of second-order capabilities, given the importance of knowledge-based resources and capabilities in service firms. The RBT and DC perspectives provide the necessary theoretical foundation to identify and examine how firms develop and acquire resources, and then bundle them together to form firm-specific capabilities in an effort to create and sustain competitive advantages. Advancements in managerial cognition and organizational learning research will further explain how capabilities are perceived, selected, assembled and modified, and how the firm’s resource base evolves over time.

1.4 Purpose of Research

This study extends several important theoretical perspectives in strategy—RBT, DC, managerial cognition and organizational learning—by exploring through case studies the evolution of firm resources and capabilities necessary to the survival and success of design firms in Singapore. Of particular interest are how resources are changed, acquired, assembled or lost as a result of the firm’s competitive activities. The phenomenon examined is process driven and dynamic, not static nor fixed in time.

In knowledge-intensive service firms, knowledge assets are of primary importance as the service outputs are delivered by skilled employees who often embody these assets. Although the firm’s knowledge base is a valuable resource, it alone cannot be the source of a sustainable competitive advantage. Only when
valuable knowledge is bundled with appropriate cognitive and learning processes can service firms achieve superior rents.

Additionally, resources—individually or bundled—may impact the firm differently depending on the context in which they are placed. Most of the work in this field has focused on large and industrial firms. Only recently have researchers begun examining cognitive and learning processes in services firms (Jones & Macpherson, 2006; Macpherson & Holt, 2007; Macpherson, Kofinas, Jones & Thorpe, 2010; Jones, Macpherson & Thorpe, 2010; Higgins & Aspinall, 2011; Higgins & Mirza, 2011). Thus, very little is currently known about the internal processes associated with managerial cognition, organizational learning and strategic renewal in medium-sized firms (Sadler-Smith, Spicer & Chaston, 2001). Eggers & Kaplan (2013) further assert that the lack of current research on the linkages between cognition and capability assembly leaves the strategy field without a bridge linking the macro level with the micro-foundation of strategic actions at the firm.

In extending beyond their local markets, firms gain access to rich information they can accumulate, absorb and codify to integrate into their existing knowledge base. The actions taken by the firm through its competitive activities draw upon its ability to learn at the level of the firm. First, it becomes important to identify how managerial cognition influences the critical resources and capabilities that are transferred to other markets to replicate competitive advantage. It is also important to observe how the knowledge gained during the process of adapting to changes in the environment impacts these critical resources and capabilities on which competitive advantage is built.
In expanding outside their core markets, firms develop the capability to exploit their existing knowledge base and to explore for new knowledge. This furthers the need to understand how a firm’s cognitive model, resources and capabilities are affected in the process. Thus, the aim of this thesis is to examine, through case studies, the relationships that exist between managerial cognition, organizational learning, dynamic and operational capabilities, routines and resources. By doing so, the study seeks to reduce the gap between abstraction of the resource-based theory and dynamic capability constructs and empirical verification, which is scarce in the strategy literature.

1.5 Methodology

In order to develop further insights on how resources interact with each other to generate value for firms, it is necessary to understand managerial cognition and actions at the level of the firm where these resources are located. Such in-depth knowledge is unlikely to be revealed across large-scale, quantitative studies, since managers are constantly involved in the process of identifying, developing, and deploying resources at the firm (Rouse & Daellenbach, 1999). Therefore, the current research aims to develop a more in-depth analysis in order to explore the resources and activities of managers at the firm level since this is where the unique attributes of resources and managerial capabilities can be best understood.

A qualitative case study approach is used which can unveil the richness of managerial cognition and actions (Lockett et al., 2009). The emergence of several factors in analysis evidences the different perspectives of managers who focus on key resources or factors and are therefore, assumed to either share
commonalities or variability based on this emphasis. The methodology uses the interview process to not only identify key resources, but also to contextualize and support the responses generated. Thick descriptions will emerge during the interviews that relate to how managers understand and ascribe meaning to the activities and processes they employ at the level of the firm in order to optimize the potential of their firms’ key resources.

1.6 Research outcome, scope and delimitations

In addition to practical contributions, the results of this research will add to the growing theoretical body of knowledge on the RBT, DC and managerial cognition. In particular, this research will extend the current understanding of the impact of managerial cognition on learning and capability assembly in service firms facing uncertainties.

The nature of the research means that some delimitations of scope are inevitable. As the data is confined to design firms in Singapore, the first delimitation is that the findings will be limited to Singapore’s design industry. Comparisons with other geographical contexts are limited by factors such as regulatory differences, country culture, maturity of markets, and so on, thus limiting generalizability.

The current research is also delimited to mid-sized design firms. Generalizations as to the findings of this research are thus limited in scope and not applicable to larger firms. Additionally, it is necessary to note that due to the many varied definitions of what exactly constitutes a mid-sized firm, care will need to be taken with the interpretation and application of results.
The current study is limited to data collected in 2010-2011. The scope excludes an examination of economic and accounting metrics to measure competitive advantage, quantifying intangible resources or in-depth exploration of country culture.

1.7 Thesis Outline

This thesis is divided into five chapters. This first chapter describes the importance of the design industry in Singapore’s economy to initiate discussion of the study’s research question. The literature review found in Chapter 2 considers the study’s theoretical foundations: the resource-based theory (RBT), dynamic capabilities (DC) and managerial cognition. This is followed by a closer look at design firms in the context of Singapore. A review of managerial cognition follows and a conceptual model and study propositions based on the RBT and DC perspectives is then presented. The study’s research question, research design and methodology are presented in Chapter 3. Chapter 4 presents the within-case analyses for all five cases and the cross-case analysis. Chapter 5 describes the study’s findings and the implication of the theoretical model and propositions and concludes with theoretical and managerial implications, study limitations and future research directions.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Chapter 1 outlined the research aims of the current thesis, which have been formulated based on gaps identified in the RBT and DC literature. The study’s theoretical framework was developed by discussing advancements in the RBT and DC perspectives. The current thesis aims to further understand how design firms evolve and remain competitive as they face uncertainties and seek external growth.

The main aim of this chapter is to present the literature review so that it grounds the present research within the RBT and DC literature. The study aims to understand the impact of managerial cognition on the reconfigurations of a firm’s resource base in an uncertain environment. The core research question then is: How do changes in the external environment influence managerial cognition and the firm’s ability to learn, assemble and modify its resources and capabilities? The aim is to identify instances of cognitive framing, and examine their connections with the different managerial actions taken to assemble or modify capabilities.

To achieve this, four streams of literature will be discussed. The first stream of literature considers the theoretical implications of the current study’s research question with respect to the RBT and DC. The literature on services firms will be then discussed in view of the recent advancement in knowledge as a critical intangible resource for firms. Finally, the literature on organizational learning and managerial cognition will be reviewed as they relate to the firm’s resource base.
Building on these discussions, the chapter will conclude by proposing a conceptual model and associated propositions to explain the linkages and relationships between cognition, learning and capability assembly.

2.2 The Resource-Based Theory and knowledge-based resources

Design firms as a sector within the creative cluster are a heterogeneous group of business enterprises with varying degrees of intangibility, inseparability, customization and capital intensity. The current study grounds its theoretical framework in the resource-based theory (RBT) and dynamic capabilities (DC) perspectives, as this conceptualization of the firm provides the foundation necessary to differentiate design services firm based on the composition of their resource base. The definitional parameters of the study are anchored within the contemporary RBT and DC literature and the perceived tautological aspects of the RBT are avoided by observing changes in the firm’s resource base, implying that the firm is doing something different, yet not necessarily better (Helfat, Finselstein, Mitchell, Peteraf, Sign, Teece & Winter, 2007)

The following section provides an overview of the RBT and DC perspectives and the components of a design firm’s resource base. The components of the resource base and their dynamic interactions are then further defined and practical examples within the context of the design industry are offered. The hierarchy of the firm’s capabilities (e.g., operational, dynamic and second-order) is also discussed. Finally, the section concludes by discussing a firm’s competitive advantage, as explained by the exploitation of its resource base.
2.2.1 The Resource-Based Theory within context of services firms

Prior research has established that a firm’s key sources of competitive advantage and strategy formulation are derived from its resources and capabilities endowment (Barney, 1991; Peteraf, 1993). The RBT posits that economic rents are secured with valuable, rare, inimitable and non-substitutable resources (assets) bundled together within the organization by using its capabilities to implement value-creating strategies (Barney, 1991). These resources are necessary for the firm to implement its strategy to the extent where it can create and gain a competitive advantage that cannot be easily duplicated by competing firms in the market (Barney, 1991; Peteraf, 1993). Thus, resources and capabilities become the core of the firm’s strategy formulation (Grant, 1991). Two important insights are derived: first, a firm’s resources and capabilities provide the direction for its strategy; and second, these resources and capabilities are responsible for driving its profits (Grant, 1991). However, not all firms have similar resource base endowments. Barney (1991) encapsulates the two core assumptions of the RBT as follows: first, the resource heterogeneity assumption maintains that there are systematic differences across firms within an industry with respect to the resources they control (Barney, 1991); and second, the resource immobility assumption states that since resources are relatively stable across firms, heterogeneity can be enduring (Barney, 1991).

Resources, routines and capabilities are what compose the firm’s resource base. Multiple terms and explanations have been used to refer to the firm’s resource base components. For example, Collis and Montgomery (1995) refer to resources as “configurations,” while Prahalad and Hamel (1990) call them “core competencies.” The term ‘resource’ is employed in its most general sense to
mean “something that the organization can draw upon to accomplish its aims” (Helfat et al., 2007, p. 4). Thus, the firm’s resource base “includes tangible, intangible, and human assets (or resources) as well as capabilities which the organization owns, controls, or has access to on a preferential basis” (Helfat et al., 2007, p. 4).

There are levels of capabilities, whereby hierarchal levels differentiate ‘operational capabilities’, ‘dynamic capabilities,’ and ‘higher-order capabilities.’ Vera, Crossan & Apaydin (2011) differentiate these three terms, stating that “operational capabilities represent how things are currently done, dynamic capabilities change operational capabilities, and learning is the ultimate capability that guides the development, evolution, and use of dynamic and operational capabilities” (Vera, Crossan & Apaydin, 2011, p. 164). This is an important differentiation that proposes an evolutionary cycle: investments in learning lead to the creation, development and modification of dynamic capabilities, which in turn change, modify, transform and create operational capabilities and resources. This assertion builds on earlier theoretical work that suggested that “learning capabilities act as the source of dynamic capabilities, while operational capabilities are the visible outcomes of dynamic capabilities” (Easterby-Smith & Prieto, 2008, p. 237).

Collis (1994) was the first to advocate that capabilities can exist on various levels. At the most fundamental level, capabilities refer to the routines that enable firms to deploy their resources in order to earn a living in the present; these capabilities are also called ordinary, substantive, or zero-order capabilities (Winter, 2003; Zahra, et al., 2006). Capabilities at the next le allow the firm’s fundamental
capabilities and resources to change; these are commonly referred to as “first-order” dynamic capabilities (Eisenhardt & Martin, 2000; Teece, et al., 1997).

At an even higher level of abstraction, Collis (1994) identifies “second-order” capabilities that can be used to develop first-order dynamic capabilities. Zollo and Winter (2002) elaborate this idea further, particularly emphasizing the importance of organizational learning routines as the mechanism underlying second-order dynamic capabilities. The authors build on existing learning theories to suggest that deliberate learning efforts that are based on selection and retention (Gavetti & Levinthal, 2000) become routinized over time as they are stored in the organization’s procedural memory (Cohen & Bacdayan, 1994). While learning routines have always been considered an important component of first-order dynamic capabilities (Mahoney, 1995; Teece, et al., 1997), they are at least equally or even more important when developing these capabilities (Easterby-Smith & Prieto, 2008; Kianto & Ritala, 2010). In this sense, second-order dynamic capabilities can be thought of as “learning-to-learn” capabilities (Collis, 1994); they are sometimes also referred to as meta or regenerative dynamic capabilities (Ambrosini, et al., 2009).

Examples of relevant learning efforts on which second-order dynamic capabilities are based include deliberate analysis of what aspects of the current first-order dynamic capabilities do and don’t work, codification of past experience, and transfer of relevant knowledge within the organization (Heimeriks, Schijven, & Gates, 2012; Helfat, et al., 2007; Zollo & Winter, 2002). These activities underlying second-order dynamic capabilities resemble many of the elements of Nonaka’s (1994) knowledge spiral, in which organizational knowledge is embedded and
institutionalized within the organization while also continually developing. The idea of “learning to learn” is also strongly related to Argyris and Schön’s (1978) concept double-loop learning, which involves scrutinization of organizational learning systems.

To achieve a competitive advantage, firms exploit differences in resources and capabilities not readily available to competitors. Firm resources alone are not the source of competitive advantage (Amit & Schoemaker, 1993). Dynamic capabilities—otherwise captured by the routines and processes that alter the firm’s resources and operational capabilities to generate new resource combinations—are the drivers of competitive advantage (Eisenhardt & Martin, 2000; Grant, 1996; Teece et al., 1997). Dynamic capabilities do not merely accrue to the firm (from a good fit with industry or environmental requirements), but are developed consciously and systematically by the willful choices and actions of the firm’s managers (Grant, 1991; Teece et al., 1997). By adapting the resource base, dynamic capabilities can create better matches between the configuration of a firm’s resources and external environmental conditions (Teece, 2007; Teece, Pisano, & Shuen, 1997; Zahra, Sapienza, & Davidsson, 2006). The capability to do so is driven by two cognitive processes: identifying the purpose for which capabilities are applied and interpreting what the firm can do with them (Eggers & Kaplan, 2013). Thus, in order to create and modify dynamic capabilities, the firm will need to deliberately develop an understanding of these cognitive processes while investing in learning capabilities, as identified by second-order capabilities (Winter, 2003). Thus, appropriate managerial cognitive model and learning, as embodied in second-order capabilities (Vera et al., 2011), may lead to a
sustainable competitive advantage because they build a continuous renewal of the firm’s resource base (De Geus, 1988).

The dynamic capabilities view, in comparison with the earlier industrial organization view (e.g. Bain, 1955; Porter, 1990) and the RBT (Wernerfelt, 1984), assigns a prominent role to the managerial decision-makers in the formulation and implementation of competitive strategy. Organizational learning theory argues that the firm must learn from multiple sources, and that knowledge results from this learning. Dynamic capabilities are the routines through which the firm learns from the market, the firm’s network of relationships and the learning that is harnessed internal to the firm itself and determined by the cognitive frames of managers.

2.2.2 Resources

Firm resources are the building blocks of the RBT. They encompass specific physical, human, and organizational assets that are used to create value-added strategies forming the basis of the firm’s competitive advantage (Barney, 1991; Peteraf, 1993). These assets have, in the past, been categorized as human, physical or organizational (Barney, 1991), renewable or non-renewable, and tangible or intangible (Grant, 1991, Teece et al., 1997), among other distinctions.

Consensus has yet to be achieved and no overarching typology exists for resources. On this critique of the RBT, Barney (2001) explains: “Resource-based theorists do not pretend to be able to generate a list of critical resources every firm must possess in order to gain sustained strategic advantages’. However, theorists describe the attributes resources must have if they are going to be sources of sustained strategic advantage for firms” (Barney, 2001, p. 51). Even based on these VRIN attributes, there does not appear to be a comprehensive typology.
Hence, it is assumed *a priori* that the purpose of the exercise is not to classify resources into distinct and exclusive groups, nor is it to provide a comprehensive list of resources found in design firms. Rather, this discussion proposes an overview of the resources highlighted in the service firm literature as being of greatest importance, while acknowledging that there are different types of resources critical to the firm. Furthermore, the typology offered by Løwendahl (2005) does not provide mutually exclusive groups of resources. The discussion of resource classification is one that is ongoing and has yet to provide a distinctive typology. For this reason, Løwendahl’s typology is used as a springboard in this section to review previously established critical resources within service firms.

Current researchers have shown greater interest in knowledge and other intangible assets as a means of building competitive advantage (Teece, 2007). Examples of intangible resources include organizational and knowledge assets (such as customer and supplier relationships), formal and informal network contacts, organizational structure, technical know-how, and professional know-how. Løwendahl (2005) proposes four different resource categories that provide some basis for differentiation: a) financial resources; b) tangible resources; c) human resources; d) intangible resources. Table 2 further describes each resource category and provides sample resources.

2.2.2.1 Financial resources

Design firms rely heavily on intangible versus tangible resources. Their initial capital investments are often significantly lower than in manufacturing firms, for example. For this reason, design firms, and especially design SMEs, encounter greater difficulty in obtaining debt financing (Cressy & Olofsson, 1997). Studies on
professional design firms have further identified that funds are most often raised without the help of outside investors (von Nordenflycht, 2010).

2.2.2.2 Tangible resources

Design firms often have few physical resources that are critical to their design delivery (Maister, 1993; Løwendahl, 2005). However, it is important to acknowledge that in some cases, firms may depend on their physical infrastructure to house their internal activities. This is especially true of location-based designs (Ball, Lindsay and Rose, 2008). As such, noted as critical resources are the physical technological infrastructure and office space and, in some cases, laboratories and test facilities (Teece, 2003).

2.2.2.3 Human resources

In small or medium-sized firms, the founder’s cognitive ability is recognized as a critical resource to the firm (Alvarez & Busenitz, 2001). The founder is seen as a valuable, rare, difficult to imitate and non-substitutable resource that plays an important role in recognizing opportunities and their potential value in the firm’s external environment. In searching for and recognizing these opportunities, the entrepreneur’s previous knowledge and experience play an important role. Prior knowledge is idiosyncratic and enables recognition of certain opportunities (Shane, 2000; Venkataraman, 1997). Prior knowledge is sourced from work and personal experiences, education (Venkataraman, 1997), and by playing different roles (e.g., in an organization, in a value chain) (Shane, 2000). Prior knowledge influences the entrepreneur’s ability to perceive, comprehend, extrapolate, interpret and apply new information in ways that may not be replicated by those lacking similar knowledge (Roberts, 1991). Founders of firms are also seen as a
critical resource to their firm because of their crucial task of securing and allocating resources that enable firms to seize the recognized opportunities (Garnsey, 1998). By way of their relationships, entrepreneurs are able to access, mobilize and deploy resources that may otherwise be unavailable to their firm. Via their networks’ close and weak ties, entrepreneurs are then able to access critical asset providers (e.g., investors, strategic partners, key customers) who may in turn offer to provide access to resources necessary to seize a recognized opportunity (Elfring & Hulsink, 2003).

Skilled workforce is also a critical resource to the firm as they provide the necessary input to deliver a firm’s designs: knowledge. Design firms rely heavily on their “intellectually skilled workforce” as frontline workers (von Nordenflycht, 2010). Scholars (Maister, 1993; Løwendahl, 2005) have differentiated this degree of dependency based on the level of customization of the design when delivered to the client. The more the design requires innovative problem solving (as opposed to replicating or modifying existing solutions), the more the firm will be dependent on its professional workforce (Maister, 1993; Løwendahl, 2005). To make effective use of human capital, firms often apply division of labor. Partners and senior associates whose time is more expensive are tasked with locating new clients, nurturing existing client relations, overseeing project preparation, and coaching and coordinating the activities of junior employees. In most firms, there are multiple levels of seniority, where managing partners or project managers are tasked with coordinating administration and associates complete the expert work of low to moderate complexity (Maister, 1993). The ratio between the number of senior partners and associates to junior employees is what Maister (1993) coined
as the firm’s “leverage.” This leverage ratio paints a good picture of the firm’s bundle of human capital (Sherer & Lee, 2002).

2.2.2.4 Intangible resources

Few precise definitions of intangible resources are given in the RBT literature. By exception, Løwendahl (2005) proposes some differentiation in intangible resources: the knowledge embedded, shared and held by individuals and groups within the organization, and the traditional elements of goodwill, such as the firm’s reputation and the size and quality of its customer list (Løwendahl, 2005).

The most important resource in a knowledge-intensive firm is knowledge (Grant, 1996). Employee productivity is dependent on knowledge, whether embodied in technical equipment or explicit artifacts, or embedded tacitly in employees and organizational routines (Grant, 1996). Within the scope of this research, knowledge is defined as “the individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory, or both” (Tsoukas & Vladimirou, 2001, p. 979). This definition highlights the dynamic nature of knowledge, be it as a framework for analysis or as a process.

An important distinction must be made between ‘information’ and ‘knowledge.’ Although the terms are often used interchangeably, information is a “flow of messages,” whereas knowledge is “created and organized by the very flow of information, anchored on the commitment and beliefs of its holder” (Nonaka, 1994, p. 15). Thus, knowledge signifies a certain judgment on the significance of events or items that are contextually or theoretically framed. Tsoukas and Vladimirou continue by stating that “knowledge becomes organizational
when (...) individuals draw and act upon a corpus of generalizations in the form of generic rules produced by the organization” (Tsoukas & Vladimirou, 2001, p. 979). The processes by which organizations learn will be further discussed in section 2.2.5.

Knowledge can be either tacit or codified (Polanyi, 1962). Tacit knowledge is often referred to as implicit or embodied knowledge, or “know-how” (Grant, 1996). Tacit knowledge can be observed at the individual, group and organizational levels, and shared by means of training or gained via personal experiences. Comparatively, codified knowledge is written down or communicated verbally, thus rendering it easier to transfer than tacit knowledge, which is slower and significantly costlier to transfer (Gallouj, 2002).

Following Huber’s (1991) work, there are five knowledge sources: direct experience, grafting, vicarious learning, internal objective knowledge and external objective knowledge.

• Direct experience is sourced from experiential knowledge inside the firm.

• Indirect experience comes from experiential knowledge from outside the firm.

• Gained by grafting (hiring individuals or business units who have developed this knowledge) or by vicarious learning (learning from the experience of others).

• Internal objective knowledge is sourced from internal staff or systems in the firm, and knowledge can be developed by piecing together information to create new knowledge.
• External objective knowledge is acquired from scanning and searching external published sources of information.

Knowledge is characterized based on its transferability, its appropriability, the ability for individuals to aggregate it, and its specialization. These four characteristics are further discussed below. The transferability of tacit and explicit knowledge varies (Grant, 1996) as know-how is embodied in an individual or shared within a group. The codification of tacit knowledge thus eases and renders the transfer more efficient, as tacit knowledge may otherwise be transferred only through its application or acquired through practice. The appropriability of knowledge also differs between tacit and explicit knowledge. Moreover, the capacity for knowledge to be efficiently transferred further depends on the firm’s ability to aggregate knowledge (Grant, 1996). “Knowledge transfer involves both transmission and receipt. Knowledge receipt has been analyzed in terms of the “absorptive capacity” of the recipient” (Cohen & Levinthal, 1990). “At both individual and organizational levels, knowledge absorption depends upon the recipient’s ability to add new knowledge to existing knowledge. This requires additivity between different elements of knowledge” (Grant, 1996, p. 111). The absorptive capacity of the firm ultimately modifies its knowledge base, as it integrates new external information and knowledge to existing knowledge. As such, the firm’s absorptive capacity is a second-order capability, and so will be further discussed later. Finally, given the breadth of knowledge used in a firm, and the limited capability of individuals to acquire, store and process knowledge, the specialization of individuals in knowledge areas is therefore necessary (Grant, 1996). Following Walsh and Ungson’s (1991) work on organizational memory, knowledge in both tacit and explicit forms may be stored and retained in five
repositories: the individual members, the roles and organizational structures, the organization’s standard operating procedures and practices, the organizational culture, and the physical structure of the workplace.

In contrast to knowledge, skills refer to an individual’s ability to perform a task. Skills are often more personal and contextual, use tacit knowledge, and are developed with practice (Løwendahl, 2005; Nordhaug, 1993). Interestingly, Maister (1993) provides the following important insight: “The true added value of professionals lies less in what they know than in what they can do: interview clients effectively, win their trust and confidence, diagnose their needs, and make the myriad judgmental decisions as to how each matter should be handled” (Maister, 1993, p. 155). He continues by saying that “while professional knowledge can be codified and easily shared, professional skills can only be developed through practice” (Maister, 1993, p. 155). Aptitudes, on the other hand, capture the natural talents, intelligence, artistic abilities, creativity, and intuition that can be applied to work (Løwendahl, 2005; Nordhaug, 1993). Where tacit knowledge and skills can be gained by practice and explicit knowledge by absorbing codified knowledge, aptitudes can be developed but are to some degree naturally held (Løwendahl, 2005).

At the individual level, examples of intangible knowledge-based resources include problem solving, project management, client relationship building and networking, communication and teamwork skills (Løwendahl, 2005), technical and professional know-how (Teece & Al- Aali, 2011), managerial experience, competence and acumen (Løwendahl, 2005; Nordhaug, 1993), and knowledge of client firms and their industries (Løwendahl, 2005). At the organizational
level, examples of knowledge-based resources include organizational know-how (Teece and Al-Aali, 2011), organizational procedures and culture (Løwendahl, 2005), shared language, social norms, values and rules (Winter, 2003), formal reporting structure (Løwendahl, 2005; Maister, 1993) and collective sources of information such as databases (Løwendahl, 2005).

2.2.3 Operational Capabilities

Operational capabilities are the lowest level of capabilities, defined as those that encompass “behavior that is learned, highly patterned, repetitious or quasi-repetitious, founded in part in tacit knowledge—and the specificity of objectives” (Winter, 2003, p. 991). They are the routines or collection of routines that often provide an answer to the question of “how we earn a living now” (Winter, 2003). To exemplify this level of capabilities and differentiate it from other levels, Winter (2003, p. 992) defines them as zero level capabilities without which firms will not be able to collect revenue from customers to purchase the necessary inputs to generate its products to sell to the market. Operational capabilities leverage the firm’s resources in the production and delivery of products and designs, enabling the firm to generate revenues (Winter, 2003; Helfat and Winter, 2011). One such operational capability is new product development; in this case, firms draw on their capabilities to produce new and possibly innovative products or designs to leverage their resource base. Therefore, the extent to which a construction SME operates and competes successfully, such that it generates quasi-rents, depends on its effective set of operational capabilities.

The following are important examples of operational capabilities and their relevance within the context of the design industry is discussed.
**Decision making regarding new clients and projects:**

From a strategic standpoint, management or managing partners must carefully consider whether the learning potential, resource and capabilities fit when choosing new projects and clients as this significantly impacts the firm’s potential to improve its resource base (Løwendahl, 2005).

**Resource allocation and project management:**

In striving to solve a client’s problems, the firm must have the necessary information, knowledge, skills and aptitudes to successfully define the appropriate problem and deliver a design of perceived quality. This necessitates mobilizing the proper resources to apply them to the project at hand and properly matching resources to projects for maximum value creation. As such, team creation and management must be carefully weighted to consider opportunity costs of other projects that could be missed by tying up valuable resources (Løwendahl, 2005).

**Employee recruitment, development and training:**

Employees embedded with expert knowledge and skills are the firm’s most valuable resource; therefore, the success of the firm rests on its ability to recruit, develop and retain its staff. By recruiting new employees, the firm may enhance its intangible resources. By keeping employees with valuable knowledge, skills, aptitudes and experience, the firm can increase its ability to mobilize these resources. The firm may also increase the value of these intangible resources through employee training and development programs. Intangible knowledge-based assets may also be increased by prioritizing activities and projects that enable and enhance accumulated learning at both the individual and group levels (Løwendahl, 2005).
Employee retention and compensation: By providing professionals with access to other professionals and other complementary or supporting resources, whether internally or externally to the firm (be it as colleagues or staff), the firm can significantly increase its employees’ professional esteem to enable superior performance (Teece, 2003). As such, retaining highly valuable experts becomes difficult if these individuals do not find themselves well equipped. Compensation schemes vary significantly from one firm to another, and there is significant discretion with respect to means of compensation (e.g., bonuses and other reward-based incentives) (Teece, 2003). Although human resources management tactics are not the focus of this study, it is nonetheless worthwhile to underline the importance of properly compensating highly valuable employees to counter the risks incurred by the mobility of the firm’s human capital and expert knowledge.

2.2.4 Dynamic Capabilities

Dynamic capabilities drive a firm’s competitive advantage. Teece, Pisano and Shuen proposed early on that “… it is not only the bundle of resources that matter, but the mechanisms by which firms learn and accumulate new skills and capabilities, and the forces that limit the rate and direction of this process” (Teece, Pisano & Shuen, 1992, p. 11).

The DC extends the RBT by providing insights into a firm’s evolving resource stock and associated processes, which develop in response to changing business environments (Teece and Pisano, 1994; Makadok, 2001). Teece and colleagues introduced the concept of dynamic capabilities in an effort to “identify the dimensions of firm-specific capabilities that can be sources of advantage, and to
explain how combinations of competences and resources can be developed, deployed, and protected” (Teece et al., 1997, p. 510). Eisenhardt and Martin further defined dynamic capabilities by proposing that they are “the firm’s processes that use resources—specifically the processes to integrate, reconfigure, gain and release resources—to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die” (Eisenhardt & Martin, 2000, p. 1107).

Eisenhardt and Martin (2000, p. 1106) define DCs as ‘specific strategic and organizational processes …, and strategic decision making that create value for firms within dynamic markets by manipulating resources into new value-creating strategies’. Dynamic capabilities enable organizations to modify their resource position. As such, dynamic capabilities deal with change (Helfat et al., 2007). Common examples of dynamic capabilities discussed in the literature include those that pertain to doing acquisitions, product development, country entry and alliances (e.g., Brown and Eisenhardt, 1997; King and Tucci, 2002) as well as downsizing or divestiture (Helfat and Peteraf, 2009: 98). These activities foster economically significant change (Helfat and Winter, 2011) and so are less tied to operational capabilities that allow a firm to sustain current actions and make a living in the present (Winter, 2003).

It is important to distinguish between ‘operational’ capabilities and ‘dynamic’ capabilities, as this differentiation has considerable theoretical implications (Collis, 1994; Winter, 2003). Whereas operational capabilities are geared towards output in the form of operational routines, dynamic capabilities are instead aimed at
effecting organizational change by creating and modifying operational capabilities (Zollo & Winter, 2002).

As clarified by Zahra and colleagues (2006), “the qualifier ‘dynamic’ distinguishes one type of ability (e.g., the substantive ability to develop new products) from another type of ability (e.g., the ability to reform the way the firm develops new products). A new routine for product development is a new substantive capability but the ability to change such capability is a dynamic capability” (Zahra, Sapienza & Davidsson, 2006, p. 921). The authors further suggest that although dynamic capabilities may be most valuable in rapidly changing and volatile external environments, this is neither a condition to validate nor a necessary component of dynamic capabilities (Zahra et al., 2006).

Dynamic capabilities, as embedded in organizational and strategic routines, may then serve multiple purposes, such as reconfiguring the firm’s resource base by discarding resources (Sirmon & Hitt, 2003) and recombining resources in novel ways to develop new operational capabilities (Kogut & Zander, 1992). They are idiosyncratic and unique processes that originate from the path-dependent histories of firms. Important indicators when identifying dynamic capabilities are the stability of the change process and their objective for process improvement (Zollo & Winter, 2002).

Zollo and Winter (2002) suggest as an example an organization that develops a systematic and relatively predictable process to manage its acquisitions or joint ventures based on its initial experiences. They are “specific strategic and organizational processes” (Eisenhardt & Martin, 2000) that are repetitive and rational, not reactive nor passive (Winter, 2003). As Eisenhardt and Martin (2000)
suggest, dynamic capabilities (e.g., alliancing, strategic decision making) do
demonstrate effective ‘best practices.’ Thus, contrary to traditional RBV thinking,
dynamic capabilities demonstrate signs of equifinality, homogeneity and
substitutability across firms (Eisenhardt & Martin, 2000). These capabilities may
be developed from multiple starting points and may follow different evolutionary
paths, while exhibiting significant similarities in terms of superior outcomes and
performance.

Applying Teece’s (2007) classification, firms sense opportunities through their
differential access to existing information, which results from opportunities created
through the re-synthesis of existing and new information. The sensing process
includes cognitive routines that help the firm identify issues with its existing
scanning processes and develop better approaches. This improvement involves
refining scanning mechanisms, through various uses of internal and external
resources (Nelson and Winter, 1982). Firms seize opportunities by specifying and
assessing potential business models to leverage an opportunity, using internal
knowledge and external networking. Similar to sensing processes, the seizing
process proceeds through automatic, cognitive routines, such that the firm
systematically embraces identified opportunities and activates them through its
reconfigured operational capability and resource base. Managerial cognition
drives a reconfiguration in the seizing process to facilitate organizational change.

Dynamic capabilities can be created because managers provide a vision for
processes aimed at shaping the dynamic capabilities. Several studies mention the
importance of the viewpoints and shared mindsets of the management involved,
although these were topics that were complementary to the other processes discussed (Narayanan, Colwell and Douglas (2009)

Zollo and Winter (2002) identify the importance of deliberate learning mechanisms that build on learning from experience and then create new processes and routines. The operational mechanisms that influence new process development are rooted in knowledge articulation and knowledge codification, and these reflect managerial decisions (Macher and Mowery (2009). Knowledge articulation can include managerial decisions to have functionally diverse teams, which may include co-location strategies to improve learning and problem-solving performance. Knowledge codification includes investment in information technology requirements that will identify new process development.

-Ambrosini, Bowman and Collier (2009) suggest that managerial perceptions of the environment and the need for change will trigger change in the way the resources are utilized or change in the way the resource base is configured. They argue that managerial perceptions of the environment are not necessarily based on the objective characteristics of that environment but that managers may create change based solely on their own cognitions. The literature highlights that there is a need for more attention to the links between dynamic capabilities and micro issues, particularly managerial cognition since the cognitive model about the firm’s resources affect the direction the firm’s resource renewal is pursued (Daneels, 2013; Gavetti and Levinthal, 2000).

Within the context of design firms, Maister (1993) and Lowendahl (2005) suggest that for a firm to maintain its competitive position in its marketplace, it must concern itself with skill building, improving productivity, raising client
satisfaction, and getting better business (Maister, 1993). These objectives necessitate the modification and change of operational routines and processes, some of which were exemplified in the previous subsection. If these change processes were learned and followed stable patterns, they would adhere to the criteria that define dynamic capabilities.

Another important dynamic capability in design firms is knowledge management. Easterby-Smith and Prieto (2008) suggest that knowledge management processes are indeed dynamic capabilities that modify existing resources and operational capabilities over time. Vera and colleagues further this logic by stating that “[b]ecause learning capabilities act as the source of dynamic capabilities (Zollo & Winter, 2002) and learning can be defined in terms of the processes of knowledge creation, transfer, and retention, the distinction between knowledge management and dynamic capabilities are more of terminology than of essence” (Vera et al., 2011, p. 165).

Knowledge management is a dynamic capability, as it “contributes to the reconfiguration of resources and operational routines, both because knowledge is a resource in its own right and because operational routines will be derived from the knowledge that resides within functional disciplines such as marketing, human resources and information systems” (Easterby-Smith & Prieto, 2008, p. 243).
Table 2.1: Dynamic Capabilities Indicative of Change in Operational Capabilities

<table>
<thead>
<tr>
<th>Strategic objective</th>
<th>Questions proposed by Maister (1993)</th>
<th>Modified capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill building</td>
<td>Can we develop an innovative approach to hiring so that we can be more valuable to clients by achieving a higher caliber of staff than the competition?</td>
<td>Recruitment process</td>
</tr>
<tr>
<td>Skill building</td>
<td>Can we train our people better than the competition in a variety of technical or “counseling” skills so that they will be more valuable on the marketplace than their counterparts at other firms?</td>
<td>Training and development process</td>
</tr>
<tr>
<td>Gain better business</td>
<td>Can we become better than out competition at accumulating, disseminating, and building on our firm-wide expertise and experience, so that each professional becomes more valuable in the marketplace by being empowered with a greater breadth and depth of experience?</td>
<td>Knowledge management process</td>
</tr>
<tr>
<td>Improve productivity</td>
<td>Can we organize and specialize our people in innovative ways, so that they become particularly skilled and valuable to the market because of their focus on a particular market segment’s needs?</td>
<td>Resource allocation processes</td>
</tr>
<tr>
<td>Improve productivity</td>
<td>Can we develop innovative methodologies for handling our matters (or engagements, transactions or projects) so that our delivery of designs becomes more thorough or efficient?</td>
<td>Project management processes</td>
</tr>
<tr>
<td>Raise client satisfaction</td>
<td>Can we develop systematic ways of helping, encouraging and, above all, ensuring that our people are skilled at client counseling in addition to being top technicians?</td>
<td>Project management processes</td>
</tr>
<tr>
<td>Raise client satisfaction</td>
<td>Can we become more valuable to our clients by being more systematic and diligent about listening to the market, collecting, analyzing, and absorbing the details of their business, than our competition?</td>
<td>Client communication processes</td>
</tr>
<tr>
<td>Get better business</td>
<td>Can we become more valuable to our clients by investing in research and development on issues of particular interest to them?</td>
<td>Client input processes Client assessment processes Design delivery process</td>
</tr>
</tbody>
</table>

Source: Adapted from Maister (1993, p. 225).

Zollo and Winter (2002) identify an important gap in the dynamic capabilities literature by advancing that current definitions do not indicate where dynamic capabilities come from. As such, a recent stream of the literature has explored the emergence, evolution and use of dynamic capabilities (Zollo & Winter, 2002). By questioning their creation, Zollo and Winter (2002) and Winter (2003) suggest from a theoretical standpoint that the firm’s investments in organizational learning (as identified by higher-order capabilities) result in the creation and modification of
dynamic capabilities. Prieto and Easterby-Smith suggest that “the role of knowledge and knowledge based processes has been central: dynamic capabilities are seen to evolve through pathways that can be described in terms of the evolution of knowledge within organizations (Zollo & Winter, 2002), and this knowledge is then considered as a key resource to drive competitive advantage in organizations (Grant, 1996)” (Prieto & Easterby-Smith, 2006, p. 500). Thus, dynamic capabilities would then enable the firm to renew itself by exploiting its existing knowledge-based resources and competencies, and exploring for new ones (Prieto & Easterby-Smith, 2006; Zollo & Winter, 2002). As a result, Zollo and Winter (2002) put forward the proposition that “dynamic capabilities emerge from the coevolution of tacit experience accumulation processes with explicit knowledge articulation and codification activities” (Zollo & Winter, 2002, p. 344).

The next section will further discuss how individual and organizational knowledge and managerial cognitions and organizational learning play a pivotal role in the development and modification of dynamic and operational capabilities (Easterby-Smith & Prieto, 2008; Zollo & Winter, 2002).

2.2.5 Second-Order Capabilities

In general, research on dynamic capabilities is interested in how firms build and adapt their resource base so as to maximize organizational fit with the environment (Schilke, 2013). One of these can be based on organizational routines—learned, repetitious behavioral patterns for & Teece, 2002; Winter, 2003). But if dynamic capabilities are reflected by organizational change routines, how do firms build and adapt such routines?
Scholars have suggested that they do so by employing second-order dynamic capabilities that operate on the firm’s first-order dynamic capabilities (Collis, 1994; Zollo & Winter, 2002). Consequently, a distinction can be made between first-order dynamic capabilities (routines that reconfigure the organizational resource base) and second-order dynamic capabilities (routines that reconfigure first-order dynamic capabilities). Although this hierarchy of dynamic capabilities seems to be generally accepted in the literature (e.g., Ambrosini, Bowman, & Collier, 2009; Easterby-Smith, et al., 2009; Easterby-Smith & Prieto, 2008; Robertson, Casali, & Jacobson, 2012), we still lack detailed knowledge of how exactly first- and second-order dynamic capabilities are intertwined.

Second-order dynamic capabilities—“learning-to-learn” routines that aim at reconfiguring the firm’s first-order dynamic capabilities (Schilke, 2003). The concept of second-order dynamic capabilities is to the dynamic capabilities view what (first-order) dynamic capabilities are to the RBT, and thus, has the potential to significantly improve our understanding of strategic change. From a theoretical perspective, it allows dynamic capabilities theory to respond to the question of where (first-order) dynamic capabilities come from, with an answer that is consistent with the theory’s core assumptions and that leverages some of its key concepts (most notably, organizational routines). Thus the literature argues that the sustainability of a firm’s competitive advantage is dependent on its ability to learn (De Geus, 1988) and, more importantly, its ability to manage its knowledge resources (Grant, 1996). For example, Argote and Ingram (2000) argue that the creation and transfer of knowledge in firms provide the foundation for building a competitive advantage.
Researchers acknowledge that the evolution of the firm's resource base is heavily shaped by learning processes or systems of learning (Schilke, 2013). A growing number of theorists have also suggested that organizational learning gives way to cognitive and behavioral changes (Vera et al. 2011). Individuals and groups learn in two ways: by understanding and then acting or by acting and then interpreting (Vera et al., 2011). Vera et al (2011, p. 154) define organizational learning as “the process of change in individual and shared thought and action, which is affected by and embedded in the institutions of the organization”. The authors further this definition by stating that organizational learning occurs when individuals and group learning becomes institutionalized and when knowledge becomes embedded into knowledge repositories such as routines, systems, structures, cultures, and strategy (Vera et al., 2011).

**Absorptive capacity**

New knowledge can be developed internally or absorbed from the firm's external environment. In regard to the latter, we refer to the firm’s ‘absorptive capacity’ (Cohen & Levinthal, 1990). The absorptive capacity of a firm refers to its ability to recognize the value of new external knowledge, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1990).

External knowledge is especially important in the explorative learning and for innovation (Cohen & Levinthal, 1990; Huber, 1991). Cohen and Levinthal (1990) explain that “the premise of the notion of absorptive capacity is that the organization needs prior related knowledge to assimilate and use new knowledge” (Cohen & Levinthal, 1990).
In recent research, the concept has been positioned between the fields of dynamic capability, organizational learning and knowledge management (Easterby-Smith et al., 2008). As Easterby and colleagues (2008, p. 484) explain: “[o]n the one hand, it draws attention to the need to appreciate and acquire knowledge from the external environment, especially from acquisitions and other inter-organizational relations; on the other hand, it focuses on internal processes of learning from past experience and current actions.”

The absorptive capacity construct is multi-level and encompasses all levels of the organization. However, the link between absorptive capacity and learning is most evident at the individual level (Van Den Bosch, Van Wijk & Volberda, 2003). Cohen and Levinthal (1990) propose that the absorptive capacity of a firm is dependent on the absorptive capacity of its members; however, its total is not equal to the sum of absorptive capacities at the individual level.

The organizational context of the firm must be taken into account, as the construct of absorptive capacity is dynamic and encompasses all levels of the organization. Learning at the individual level involves memory development, whereby the accumulated prior knowledge enables the ability to recognize the value of new knowledge, store it, recall it, and use it. The absorptive capacity of an organization is not the sum of its individuals’ absorptive capacity, as it depends on both its “direct interface with the external environment” and “transfers of knowledge across and within sub-units that may be quite removed from the original point on entry” (Cohen & Levinthal, 1990). Thus, knowledge specialization and communication structures are two important antecedents to the firm’s absorptive capacity.
Organizational learning is learning at the individual level within a given social context. Organizations are “seen as consisting of groups of individuals that collectively and incessantly try to make sense of a complex reality in their daily work activities ... This process is not one of simply transferring experiences between individuals, of accepting or rejecting arguments and interpretations on how to experience the same situation. Rather, it is one of jointly organizing reality so that it can be acted upon” (Holmqvist, 2003, p. 98). Furthermore, learning at the organizational level is directed by the firm’s existing standard operating procedures, practices and other organizational rules. This ensures that individuals acquire a shared subjective viewpoint and can communicate using a common language (Grant, 1996a). Thus, Holmqvist (2003) strongly concludes that the individuals are the ones who learn from their experiences and together validate the organization’s rules and routines. It is their shared actions that contribute to the maintenance or change of the organization (Holmqvist, 2003).

### 2.2.6 Influences of managerial cognition on the firm

In small and medium-sized firms, owners and managers’ managerial cognition influence the organization’s ability to learn as a result of the power and authority they embody (Vera & Crossan, 2004) because this process rests on their ability and willingness to encourage knowledge sharing (Jones & Macpherson, 2006). Medium-sized firms are sensitive to shifting business cycles, changes in the general economy and seasonal shifts (Ruddock and Lopes, 2006; Kapliński, 2008; Giang and Pheng, 2011), leading to their disproportionally high failure rates (Chan et al., 2005; Collins, 2012).
However, when firms are able to respond effectively to environmental challenges and opportunities (Jones, 2011), they may be able strengthen their economic positions and expand their market presence. In this context, sufficient resources, adequate cash flow management and good financial controls help smaller firms survive, but those factors cannot entirely explain the persistent variability in firm performance (DeSarbo et al., 2007). Thus effective cognitive framework within the organization may offer a central distinction between firms that survive and those that fail (Barrett et al., 2008; McAdam et al., 2010). Additionally, limited resources cause the smaller firms to be more dependent on learning from external sources of knowledge such as customers, suppliers and other network ties (Coviello & Munro, 1995; 1997). Thus, the internal and external sources of knowledge and the processes by which knowledge is absorbed and disseminated are of particular importance to understanding organizational learning in small firms (Fletcher and Harris, 2012).

Knowledge, when recognized as the firm’s critical resource, can lead to competitive advantage because it is difficult to copy or imitate; it is also causally ambiguous, often making it out of reach to competitors (Barney, 1991). However, multiple processes at all three levels of the organization (e.g., individual, group and organization) are necessary to embed knowledge and render it a critical resource in the organization. These processes are in themselves capabilities. For example, the process by which an individual interprets information to make a judgment, transforms the information into knowledge, and then absorbs the knowledge in its tacit form, is a learning processes that encompass the second-order capability of organizational learning (Crossan et al., 1999). Consequently, organizational learning within the context of dynamic capabilities is
concerned with strategic renewal of the firm (Easterby-Smith & Prieto, 2008). Simply put, “[b]ecause dynamic capabilities involve change, they involve learning—change in cognition and change in behavior, and because dynamic capabilities work on routines and resources, they involve knowledge—the most valuable, rare, and hard-to-imitate firm resources” (Vera et al., 2011, p. 164). Whether developed internally or absorbed from the external environment, the development of new dynamic and operational capabilities and the evolution of existing ones has significant implications for the firm’s competitive advantage as will be discussed in the following section.

The literature suggests that a particular dynamic capability can be learned through practice and the accumulation of experience. Experience with an activity that serves to modify the firm’s resource position increases the likelihood of developing a dynamic capability because it provides individuals with information that can help them better understand the causal linkages between actions and outcomes (Zollo and Winter, 2002). More experience with acquisitions, for example, supposedly enables managers to more efficiently identify best practices that generalize across deals (Barkema and Schijven, 2008). Likewise, more joint venture experience should allow managers to gain an understanding of how to select new partners, manage contract negotiations, and terminate agreements (Anand and Khanna, 2000; Sampson, 2005). In general, these arguments are consistent with learning theory describing how skill accumulates through practice (Argote, 1999).

Cognitive research have sought to explain how a managerial cognition, managerial action and the environment operate as interacting determinants of each other (Corbett and Neck, 2010). Wood and Bandura (1989) explain that individuals develop their knowledge and skills on the cognition of information they
receive through interactions with others in the environment. Thus, managers model their behavior based on what they have seen demonstrated in the environment and their behavior also shapes the environment.

Although both the dynamic capability and cognition research streams have received a lot of attention, they have developed along parallel but separate paths (Laamanen & Wallin, 2009; Kaplan, 2011; Eggers & Kaplan, 2013). Scholars have only begun to link the insights from cognition and capabilities in the form of studies that examine organizational response to change in the external environment. These studies highlight, for example, how the match between capabilities and the market cannot be made if managerial beliefs are not aligned with the opportunity (Eggers & Kaplan, 2009; Tripsas & Gavetti, 2000) or how forward-looking managerial attention to new opportunities can even compensate for a lack of needed capabilities in spurring the organization to take action (Gavetti, 2005).

While most of the work has focused on the match made between the organization and its environment, other research has shifted the focus to the micro foundations of capabilities in order to shed light on how they are developed. Here, scholars have suggested that routines and capabilities emerge from particular understandings about how things should be done (Coriat & Dosi, 1998; Kaplan & Henderson, 2005) and that the nature and usefulness of these capabilities is subject to interpretation over time (Danneels, 2011).

The structure and content of a manager’s knowledge of his/her environment influences the decisions he/she makes and behavior he/she carries out (Anderson, 1991) and that managerial cognitions are influenced by the social and cultural environment of managers (Huff, 1982, Daniels et al., 1994). Prior research has focused specifically on managers’ mental models of the competitive
environment and mainly on how managers simplify the competitive environment through categorization (Porac and Thomas, 1990). Mental models are determined partly by experience (e.g. Schoenfeld and Herman, 1982) and since each individual’s experience will not be the same as those of other individuals, there will be divergences between individuals’ mental models of competition. Marcel, Barr and Duhaime’s (2011) study showed how inter-firm heterogeneity in managers’ cognitive frameworks determined how quickly different firms respond to the same competitive action. Various other studies of managers’ mental models have demonstrated individual variability in manager’s mental models (Day and Lord, 1992; Langfield-Smith, 1992). The assumption of homogeneity of cognitive structure assumes that a team of managers is able to formulate or implement coherent strategies by sharing the same cognitions as each other (Porac and Thomas, 1990).

Managerial cognition involves the knowledge structure of managers, how managers use this knowledge to think and act on firm strategy. Managerial cognition determines how managers selectively pay attention to aspects of environmental shifts while ignoring others (Daniels, Johnson & de Chernatony, 1994). It is a key factor that facilitates the formation of capability (Gavetti and Levinthal, 2000; Gavetti, 2005; Schreyogg and Kliesch, 2007).

The cognitive perspective argues that insight into decision making requires an appreciation of the beliefs and understandings in managers’ mental models. Though a significant body of managerial and organizational cognition literature has accumulated, relatively few researchers have applied this cognitive perspective to the study of firm competitiveness.
Prahalad and Bettis (1986) suggest that executives’ dominant logics serve as “organizing paradigms,” providing them with a way to “conceptualize the business and make critical resource allocation decisions” (1986: 490). However, some studies have argued that as managerial cognition forms the dominant logic, it may result in cognitive homogeneity in organizations thereby causing cognitive inertia as the studies by Porac et al (1989) and Gavetti and Levinthal (2000) have shown.

Building on the work of Prahalad and Bettis (1986), a few studies have explored how managerial beliefs or perceptions shape their understandings of the competitive environment and how their firms are positioned relative to their competitors (Garg, Walters, & Priem, 2003; Mason & Harris, 2005; Neill & Rose, 2006).

Other studies have examined managers’ understandings of their own firms. Empirical research by Stimpert and Duhaime (1997) focused on one aspect of dominant logic – how top managers of diversified firms conceptualize their organizations, specifically how they understand their firms’ businesses to be related. They found that the managers of diversified firms hold at least three distinct views of relatedness, including traditional, marketing, and financial goals. Their study did not examine how these conceptualizations of relatedness are associated with strategic decision making or firm performance. Some studies have demonstrated how managers’ perceptions of, and beliefs about, firm resources influence decision making and performance (Kor & Leblebici, 2005; Leavy, 2001; Pehrsson, 2006; Tanriverdi & Venkatraman, 2005).

Research work by Duhaime and Schwenk (1985) argued that managers’ cognitive biases and limitations are responsible for the success or failure of acquisitions.
Research by Levy (2005) examined how managerial mindsets influence the extent of global diversification. Mental models influence how stimuli are interpreted, and suggest appropriate responses or decisions based on these interpretations. So, learning about how the managers of firms make sense of their situations and tasks is crucial to understanding the strategies of their firms. Goold, Campbell, and Alexander (1994) have also emphasized the importance of executives’ beliefs in large diversified firms. Mental models largely stem from managers’ experience and shape perceptions of business improvement opportunities (Prahalad and Bettis, 1986). As Goold et al suggest, mental models are shaped by individual experiences and by unique interpretations of these experiences. Thus, mental models about strategic decisions would be idiosyncratic. Barney (1992) suggest that executives could gain advantage by managing their firms in novel ways. Researchers including Huff (1982 and Spender (1989) suggest that there may be patterns or varieties of managerial beliefs that are widely held among managers.

2.2.7 Managerial cognition as a source of competitive advantage

Thus, the current study argues the quality of managers’ knowledge structures is a significant source of advantage for design firms. Although managerial performance is highly dependent on a variety of contextual factors (Karaevli, 2007), Barney (1992) asserts that if managerial cognition about capabilities are effective and difficult to imitate, then they can be an important source of advantage. For some firms, managers’ knowledge structures may foster the creation of unique and valuable sets of administrative practices or the ability to make especially effective decisions (Teece, 1982). These effective decisions and administrative practices are an important source of advantage for some companies, and they offer a plausible explanation for the considerable performance variation across firms.
Hence, dynamic capabilities are contingent upon managerial expertise (Holcomb et al. 2009) and managerial cognition (Adner & Helfat 2003). Yet the prevailing models of dynamic capabilities and their foundations (Helfat et al. 2007; Teece 2007) provide little detail despite an understanding that the managerial cognition that inform decision-making regarding dynamic capabilities is crucial to our understanding of the phenomenon (Helfat et al. 2007; Teece 2007; Eggers & Kaplan, 2013). This study combines these complementary perspectives to extend the RBT and DC frameworks by clarifying the influence of its managerial cognition on changes in the firm’s resource base in the context of Singapore’s design industry.

2.2.8 Competitor Identification

The fact that all firms are subject to competition presents a challenge for managers since competitors' actions and activities directly impact the firm's firm profitability and ability to attain competitive advantage (Chen, 1996). Thus, managers are motivated to understand their competition in order to develop a defensible strategy (Porter, 1980). The literature suggests that competitor identification occurs during the managerial activity of competitor analysis (Porter, 1980; Peteraf & Bergen, 2003) Bergen & Peteraf (2002) suggest a two-step process where competitor identification leads to competitor analysis. First, competitor identification presents managers with the task of determining the appropriate set of firms to be analyzed which is necessary due to limited managerial resources (e.g. time and attention) and bounded rationality, which together dictate that a manager cannot analyze and keep track of all organizations in the external environment (Bergen & Peteraf, 2002). The competitor identification step is important since the quality of the analysis depends on
managerial cognition (Eggers & Peteraf, 2013; Peteraf & Bergen, 2003). Once competitors are identified, managers proceed to form an accurate cognition of each firm’s competitive capability or competitive position (Bergen & Peteraf, 2002; Porter, 1980). An accurate cognition of each competitor not only provides managers with the ability to predict future competitor moves and understand potential competitive threats, but also builds an awareness of the competitive environment and the opportunities available to position the firm to attain competitive advantage (Porter, 1980; Chen, 1996).

2.2.9 Competitive dynamics

To understand the notion of competitiveness, the literature on competitive dynamics provides a useful theoretical lens with which to explain and predict competitive interactions between competitors and the impact of these interactions on firm performance (Ketchen et al., 2004). The competitive dynamics literature traces the origins of the inquisition into the competitive nature of industries to the pioneering work of Joseph Schumpeter upon which the Austrian School of Economics was founded (Jacobson, 1992). Schumpeter’s postulation was that firms operating within a particular market are in constant interaction with one another as they vie for competitive advantages within the industry through the initiation, execution or reaction to the competitive actions of their competitors aimed at creating and destroying temporary competitive advantages thus preventing markets from ever attaining a state of equilibrium (Schumpeter, 1950; Nokelainen, 2010; Turgay & Emeagwali, 2012). Building on this notion of ‘creative destruction’, competitive dynamics researchers seek to understand how competitive advantages are acquired, sustained and eroded in different industries,
giving rise to nascent research streams such as strategy as action, competitive interaction and action repertoires (Smith & Grimm, 1991; Smith et al., 1992; Olivia, Day & MacMillan, 1988; Chen et al., 1992; Nokelainen, 2010).

Firms competing with others seek a competitive advantage by improving their position compared to the competitors. Once they have gained this advantage, their competitors will in turn try to secure an advantage in order not to be overtaken or left behind. This gives rise to a dynamic within the sector or industry that makes it necessary for firms to invest ever more resources to remain in an identical competitive position. Derfus, Maggitti, Grimm, & Smith (2008) describe this competitive spiral as the Red Queen Effect (RQE). The process suggests that, faced with competition, firms will try to stand out and gain a competitive advantage by developing new ways of doing things. They thus create disequilibrium in the environment and their competitors are then faced with a firm that is more successful than theirs. In turn, the competitors attempt to develop better solutions in order to obtain a new competitive advantage and thus improve their performance (Barnett, 2008). This co-evolutionary approach illustrates the impact of competition on firms and on the sector overall (Barnett, 1997; Barnett, 2008).

Prior studies show that changes in response to competition can result in an improvement or a decline in a firm’s performance (Derfus et al, 2010). When a firm responds to a market opportunity with an appropriate action, it also shows the other firm how to respond. With this new knowledge, competitors can imitate the actions acknowledged as successful. Knowledge accrual on competitive behavior in this way facilitates organizational learning (Barnett & Pontikes, 2008), enabling
competitors to develop new strategies, which may lead to new offerings (Derfus et al., 2008) or new business models based on strategic innovation (Voelpel, Liebold, Tekie, & Von Krogh, 2005; Plé, Lecocq, & Angot, 2010). Thus, the RQE effect may have a positive impact on business performance by stimulating organizational learning and encouraging firms to experiment and develop new strategies.

Nonetheless, managerial action is guided by managerial cognition of competitive relations which direct managers to act in a specific way (Kilduff et al., 2010). The RQE considers interdependence between competitors as a positive element, unlike other approaches in strategy. Some strategy scholars advocate avoiding competition altogether by developing a differentiation strategy (Porter, 1981), the use of specific resources and competencies (Barney, 1986), or the creation of a specific new space (Kim & Mauborgne, 2005). These scholars encourage firms to find an advantage that protects them from or reduces competitive intensity. In contrast, other scholars advocate head-on collision strategies as a means to promote a situation “of mutual forbearance” between rival firms in order to reduce competitive intensity (Karnani & Wernerfelt, 1985; Jayachandran, Gimeno, & Varadarajan, 1999; Bensebaa, 2001), and the protection of “spheres of influence” (Gimeno, 1999). The RQE challenges this view by suggesting that exposure to competition, and the ensuing interdependence between competitors, is one of the ways that managerial capabilities can develop (Barnett & Hansen, 1996; Barnett, 2008).

While the decision to respond to competition is a voluntary one the RQE process is presented as automatic and analogous to biological models (Barnett & Hansen,
Ultimately, cognitive processes drive managerial actions that have a competitive impact (Kilduff, Elfenbein, & Straw, 2010). Competitors may have a specific motivation, pushing them beyond a simple traditional competitive mindset. Thus, the competitive process like the RQE, where firms are caught up in a continual race for competitive advantage, add to the cognitive intent of managers and influence their strategic intent with regard to the competitors. Thus the trigger to pursue or opt out of an RQE-type competitive situation depends more on the way the competitive relationship is experienced by managers, rather than on the objective characteristics of the firms.

**2.2.10 Competitive blind spots**

Competitor analyses are important because they help managers to avoid “competitive blind spots,” in which managers are unaware of specific competitors or their capabilities (Ng, Westgren and Sonka, 2009). If managers have competitive blind spots, they may be surprised by a competitor’s actions, thereby allowing the competitor to increase its market share at their own expense. Competitor analyses are critical when a firm enters a foreign market. Managers will need to understand the local competition and foreign competitors currently operating in the market since without such analyses, they are less likely to succeed (Hitt, Ireland and Hoskisson, 2011).

Competition is not limited to product markets but can occur at any point along firms entire value chains; wherever firms occupy the same competitive space, rivalry follows. Markman et al. (2009) proposed a framework of factor-market rivalry which uncovers the competitive blindspot, particularly when competition ensues under conditions of either resource dissimilarity or product-market non-
commonality. Factor-market rivalry suggests that firms may forbear in product markets because they hope to maintain forbearance in factor markets, especially along critical areas of their value chain. However, Markman, et al (2009) assert that it is the blind obedience to socially constructed categories such as industries, products and customers which causes firms, including powerful incumbents, to get blindsided in their own industry.

2.2.11 Competitive Advantage

It is important here to recognize the implications of the firm’s resource base for its competitive advantage and to note that a firm’s valuable resources alone are insufficient to achieve a competitive advantage - they must be leveraged and bundled effectively to do so. Peteraf and Barney (2003) argue that a firm has a competitive advantage “if it is able to create more economic value than the marginal (breakeven) competitor in its product market” (Peteraf & Barney, 2003).

As discussed earlier, prior research suggests that having dynamic capabilities per se does not lead to superior firm performance (Eisenhardt & Martin, 2000). Eisenhardt and Martin (2000) note that dynamic capabilities are rarely the source of competitive advantages because there are multiple ways of achieving similar outcomes through a particular dynamic capability. In agreement with Eisenhardt and Martin (2000), Easterby-Smith and Prieto (2008) further suggest that while dynamic capabilities do not themselves lead to competitive advantage, competitive advantage depends on the new configurations of resources and operational capabilities that result from them.

However, dynamic capabilities are costly to the firm because they require resource allocation and they may be used to achieve misguided goals (Zahra et
al., 2006). Zahra et al. (2006) instead propose that “the relationship between dynamic capabilities and performance is mediated by the (resulting) quality of [operational] capabilities”, and that “the effect of [operational] capabilities (and, indirectly, dynamic capabilities) on performance is moderated by organizational knowledge such that low organizational knowledge increases losses and high organizational knowledge increases gains” (Zahra et al., 2006, p. 943).

As a result, the value of dynamic capabilities for the creation and sustenance of competitive advantage resides in the firm’s ability to modify its resource base (Eisenhardt & Martin, 2000). This is done in response to opportunities or threats detected in the firm’s external environment (Barney, 1995) when the exploitation of valuable, rare and costly-to-imitate resources would bring to the firm an increase in economic rent. However, because of hypercompetition (D'Aveni, 1994), sustaining a competitive advantage over time is rather a function of creating a series of short-term competitive advantages (Eisenhardt & Brown, 1998; Wiggins & Ruefli, 2005). The sustainability of a competitive advantage lies in the way the resource base is continuously configured and reconfigured using dynamic capabilities. It is a matter of beating the competition to the punch to create resource configurations that hold competitive advantage sooner than other market players, in a more sensible and intelligent manner or simply by chance (Eisenhardt & Martin, 2000).

The sustainability of a competitive advantage has been discussed at length in the literature. As such, scholars now suggest that the firm’s ability to learn at the organizational level may be the only truly sustainable competitive advantage (De Geus, 1988), given that to sustain competitive advantage, resources must be constantly renewed (Teece, 2009). The importance of higher-order capabilities is,
therefore, implicit. Increasingly, scholars agree that “(...) firms must build assets and capabilities that enable positive differentiation. Knowledge assets such as technical and organizational know-how can provide this differentiation. Accordingly, they can undergird a firm’s competitive position” (Teece & Al-Aali, 2011). As a result of creating, maintaining and protecting these non-tradable intangible assets and capabilities, firms may build competitive advantage to secure long-term profitability (Teece & Al-Aali, 2011).

Thus, going forward, our interest lies in how knowledge-intensive firms, such as design firms, renew their resource base while engaging in competition. The importance of this interest is fundamental to the firms’ abilities to remain competitive and succeed, whether in the local or foreign markets. The current study seeks to understand the impact of managerial cognition on second-order and dynamic capabilities, and asks how the external environment affects the evolution of the firm’s resource base components.

2.2.12 Philosophical linkage between competitive advantage and firm performance

Next, this section will discuss the notion of the philosophical linkage between competitive advantage and firm performance in the literature and its implication for managerial practice. From strategic management’s inception as a scientific field circa 1980, with the launch of the Strategic Management Journal and the publication of Porter (1980), strategy researchers had always depended upon large scale, quantitative ‘variance approach’ to develop particular understandings of the linkages between competitive advantage and firm performance (Abell,
Hypothesis formulation and testing using large samples were the order of the day. With the advent of the RBT and its emphasis on knowledge resources, particularly tacit resources, some researchers raised a thorny issue in strategic management - what is the explanatory role of ‘unobservables’? (Godfrey and Hill, 1995). Godfrey and Hill (1995) gave weight to the debate by applying the realist position that ‘unobservables’ may be defended by inference to the best explanation, that is, a better performing (predictive) theory that involves ‘unobservables’ is preferred on account of its possible superior performance (Lipton, 2004). Powell (2001) explores the philosophical linkage between competitive advantage and firm performance by arguing that (1) competitive advantage is not a necessary and sufficient condition for superior firm performance; (2) there is no falsifiable theory of competitive advantage without resort to ideology, dogmatism or faith; (3) at best, competitive advantage is a metaphor which is useful to the strategic management community.

In response, Durand (2002:868) asserts that ‘competitive advantage is a sufficient but not necessary condition requiring a conjunctive factor, which is presumably organization.” Arend (2003) counters Powell’s first point by arguing that the term ‘competitive advantage’ has a relative basis, specifically relative to competitors because if all competitors hold the same absolute competitive advantage then there is no relative advantage and competitive forces would eliminate available rents. Arend (2003) further asserts that research using relative measures that considers both positive and negative causes of performance is logically valid. On Powell’s second point, Arend (2003) argues that so long as strategy research helps solve problems in explaining firm performance better than other theories,
then it has pragmatic value regardless of the scientific value of the research. Strategy research is ultimately about helping firms make better decisions to improve and sustain firm performance.

Finally, Powell (2003) reasserts that strategy prescriptions require consistent epistemological foundations since the process of strategy research has little in common with what managers actually do in practice to achieve superior firm performance. Researchers design their work to explain known performance outcomes, but managers do the reverse, identifying and mobilizing factors to create superior performance. Hence, the reality is that pragmatism plays a significant role as a philosophical foundation for transferring knowledge to managers by providing strategy researchers with a consistent intellectual foundation from which to connect with managerial practice (Powell, 2003).

2.3 An Overview of the Design Industry in Singapore

In Singapore, the mid-sized design firm (which employ up to 100 people) account for 85% of all design firms and contributed about 77% of the industry's value in 2012, in terms of gross domestic product (Singapore Government, 2011). Most design firms in Singapore feature independent ownership and operations, including close control and centralized decision making by owners/managers. In addition, smaller firms often lack sophisticated decision support systems (Heyden et al., 2013). Instead, a central decision maker, such as the founder or managing partner/director, usually is responsible for initiating innovations or organizational changes. Such senior managers exert disproportionate influences on firm
decisions and participate in a fluid mix of strategic, tactical and operational choices (Powell et al., 2011). In turn, decisions by senior managers tend to permeate the organizational processes of these design firms (e.g. Boone et al., 1996; Simsek et al., 2010).

Another common trait of the medium-sized design firm is their agility and flexibility (Dainty et al., 2001), yet this strategic advantage also creates a significant challenge, in that the firm must constantly scan its external environment (Reichstein et al., 2005), react to changes in that environment with appropriate strategic responses (Love and Irani, 2004; Packham et al., 2005), ensure constant resource renewal (Jones et al., 2011) and conduct R&D, all with limited financial and human resources. These traits strongly impede the smaller firms’ capability to innovate (Cobbenhagen, 2000). Yet to remain competitive, firms generally need to develop and evolve capabilities to sustain themselves (Gann, 2000; Sexton and Barrett, 2003). For many design firms in Singapore, expanding abroad is a necessary growth strategy due to the small Singapore economy and necessitated by the fall in protective regulatory barrier, subject to the onslaught of large-scale foreign competition.

Design designs are differentiated from other types of offerings by four distinct characteristics: their intangibility, perishability, heterogeneity, and inseparability (Lovelock, 1991; Zeithaml, Parasuraman & Berry, 1985). These characteristics impede storability and even display for any length of time; render inventory impossible, where the design perishes if not consumed at a specific time; cause greater control difficulties because of fluctuating quality and sometimes impossible standardization; and often require the production and consumption of the design
to be simultaneous, making the end-consumer an active part of the design delivery process.

Knowledge-intensive designs have gained greater attention and interest, as they largely provide the critical infrastructure to most economies, e.g., transportation, information and communication technologies, business designs, etc. (Maister, 1993). Given the wide array of economic functions that designs fulfill, this group of organizations is often characterized as heterogeneous. In fact, not all designs require the same level of specialized knowledge and skill to deliver outputs (Miles, 2008). Knowledge-intensive firms (KIFs) are defined as those where knowledge is the most important input in the firm’s production processes. Good examples of KIFs are PSFs, which rely on professional bodies of explicit knowledge, such as law and accounting firms, and shared bodies of tacit knowledge, such as management consulting firms and advertising agencies.

2.3.1 Attributes of Design Firms

Designs firms have following attributes (1) knowledge intensity, (2) low capital intensity and (3) skilled workforce (von Nordenflycht, 2010).

Knowledge Intensity. A design is said to be knowledge intensive when the “production of a firm’s output relies on a substantial body of complex knowledge” (von Nordenflycht, 2010, p. 159). The author explicitly emphasizes the firm’s heavy reliance on the knowledge base embodied in an ‘intellectually skilled workforce.’ This is in contrast to other firms that instead rely on the knowledge embedded in organizational routines, equipment and products. As a result of this knowledge intensity, PSFs must overcome unique managerial challenges in
regard to employee (and knowledge) retention, worker autonomy, and authority. This is due to the increased bargaining power held by individuals with complex knowledge who can simply walk away from the firm with its most valuable resource. Furthermore, additional challenges are encountered when employees interact with customers. The level of embedded knowledge and expertise held by the employee renders the customer’s evaluation of the design or product very difficult or impossible. This knowledge asymmetry encapsulates the challenge of ‘opaque quality’ (von Nordenflycht, 2010).

**Low Capital Intensity.** The presence of low capital intensity indicates that “a firm’s production does not involve significant amounts of nonhuman assets, such as inventory, factories and equipment, and even intangible nonhuman assets like patents and copyrights” (von Nordenflycht, 2010, p. 162). The implications of low capital intensity are significant, as they heighten the importance and negotiating power of human capital resources. The absence of specialized nonhuman capital decreases barriers to entry and enables individuals with the necessary knowledge base to enter the market. Again, the mobility of the firm’s knowledge poses a continuous risk. However, low capital intensity positively impacts PSFs by allowing them to adopt organizational structures that are unhindered by external investment obligations (von Nordenflycht, 2010).

**Skilled Workforce.** von Nordenflycht (2010) state three institutional features that are of particular interest to the study of design firms. The first is a particular knowledge base. The second is regulation and control of that knowledge base and its application. This encompasses several features: that a profession has a monopoly on the use of that knowledge; that it regulates that monopoly autonomously, rather than being regulated by the state; and that such regulation
not only excludes non-professionals but also mitigates competition among professionals. The third feature is an ideology” (von Nordenflycht, 2010, p. 163). The degree of professionalization differs between sectors of design firms (for example, advertising agencies are more or less professionalized whereas accounting firms are highly professionalized). Firms that are highly professionalized may overcome opaque quality simply by adhering to the codes of ethics and norms developed by the self-regulated body to which they belong. Organizations that are not professionalized, such as management consulting firms, instead rely on other means like reputation and brand to gain client trust and overcome opaque quality.

Given the importance of the knowledge base embedded in their human capital resources, design firms face employee retention challenges. Their low capital intensity has also resulted in unique organizational structures, such as models based on accession to partnership. Examples include graphic design and interior design firms and advertising agencies. The way a design is delivered to the end client, whether at arm’s length or in direct physical contact with the design organization, influences the firm’s organizational structure (Lovelock, 1991).

2.3.2 Services provided by Design Firms

As this study focuses on design firms, general facets of their business models are discussed to provide an overview of the resources and capabilities necessary to the firm’s ability to output its designs. Design operate in a multitude of fields, which results in a highly heterogeneous industry7. This heterogeneity in design
service providers is heightened by the large array of designs rendered to both public and private clients. Typical design work scope include the following:

- Consultation and advice;
- Feasibility studies;
- Field investigations and design data collection;
- Environmental assessments and impacts statements;
- Design reports;
- Estimates of probable construction costs;
- Designs, drawings, specifications, and construction bidding documents;
- Assistance in securing construction bids and awarding contracts;
- Construction administration and observation;
- Arrangements for or performance of materials and equipment testing;
- Assistance in start-up, assessment of capacity, and operation of facilities;
- Provision of supplemental temporary staff.

The design firm’s ability to provide a design offering that matches a client’s specific need for that design is grounds for its success (Maister, 1993). To provide this design, the firm must have the necessary resource base (i.e. resources and capabilities) to ensure proper delivery. The size of the firm may impact the resources it has at its disposal and therefore its ability to offer complete designs. The firm’s formal and informal relationships in its network (Owusu, Sandhu & Kock, 2007) and its access to specialized human capital (Hitt, Bierman, Shimizu &
Kochhar, 2001; Hitt, Leonard, Klaus & Katsuhiko, 2006) are therefore also valuable resources.

The level of complexity of a design may differ from one client to the next, and this level of complexity impacts the resources and capabilities the firm needs to provide their designs (Maister, 1993; Løwendahl, 2005). In general, clients look to their design consultant for its ability to meet specific objectives. Effective use of financial resources and soundness of design are two relevant examples. Design firms often provide designs via a project business form whereby teams are created and the project is organized based on client requirements. The scope of projects may vary from the use of individual employees to individually operated teams that are supported by additional organizational resources. These designs may be provided directly to the client on-site or via the design design's facilities, depending on the nature of the delivered design. In each design delivery scenario, expectations are outlined in project documents where budget, timeline and scope are agreed upon (Hansen & Kent, 2011).

The frequency of repeated sales from a single client varies significantly from one industry to the next, as it depends on the nature of the client’s needs (e.g., government clients will have distinctly different needs from those of private companies). Design service providers must then be equipped with project management skills, expertise and processes to ensure that design delivery is properly completed. Furthermore, client interaction and communication capabilities are required to meet client expectations and ensure a continuous understanding of the project requirements and advancements. In addition, the firm must also strategically position itself in a market where frequency of repeat sales best uses its resources (Løwendahl, 2005).
The typical organizational structure often adopted in design firms differentiates levels of employment based on experience: (i) the principals find the work; (ii) the associates oversee the work, and iii) the junior professionals complete the work (Maister, 1993).

Thus, organizations may be concerned with making investments in procedures, processes and modular solutions to enable a more efficient design delivery when solving similar client problems (Løwendahl, 2005). Furthermore, the use of senior staff’s time and expertise will differ with the complexity of the design being delivered. As such, the organization’s ratio of senior to junior staff should reflect its human resources needs and be aligned with its design offering (Maister, 1993; Løwendahl, 2005). Critical to the success of the firm is the expertise it holds embedded in its human capital (Hitt et al., 2006), as are the firm’s reputation and its perceived professional ethical practices (von Nordenflycht, 2010).

An important value-creating process is that of continuous learning from the two previous processes to improve the efficiency and effectiveness of future projects (Løwendahl, 2005). As discussed earlier, learning at the organizational level is embodied in behavioral and cognitive changes that result from experience accumulation, knowledge articulation and knowledge codification (Zollo & Winter, 2002).

One way design firms may gain rich knowledge and expertise is by completing projects internationally. Often, their choice of foreign markets is a by-product of winning a project contract (O’Farrell, Wood & Zheng, 1998) and their exit may follow the project completion (Krull, Smith & Ge, 2012). Geographic expansion has been identified as one of the most important move for firm growth (Lu &
Beamish, 2001), particularly for firms whose domestic market is geographically confined (Barringer & Greening, 1998). This statement is also supported by D’Souza and McDougall (1989) who argue that the ability to engage in export is a necessary step to ensure the survival and growth of new and small firms. The reduction or elimination of trade barriers, the emergence of more efficient and less costly transportation modes, and the creation of new communication technologies all facilitate simultaneous interaction. Thus, competition increases significantly for firms operating solely in their domestic market because they may face international competitors. Technological, political and societal changes have internationalized competition in many industries, putting increasing pressure on firms to follow suit (Porter, 1990.). Consequently, owner/managers seeking opportunities may not necessarily find them in their domestic markets (McDougall & Oviatt, 2000) and international expansion may be identified as a viable growth strategy.

2.3.3 Knowledge and Learning

The firm’s ability to learn at the organizational level and to acquire market knowledge is a common capability necessary in global firms (Andersen, 1993; M. K. Erramilli & D’Souza, 1993; Zahra, Ireland& Hitt, 2000). Oviatt and McDougall (2005) suggest that the speed at which a firm is able to learn about a new host country moderates the speed at which it exploits an identified opportunity (Oviatt & McDougall, 2005). Others have determined that knowledge of foreign markets and operations and the efficiency at which it is learned are determinants in the international sales growth of entrepreneurial small firms (Autio et al., 2000).

Knowledge intensity has been found to be a major source of international competitive advantage (Coviello & McAuley, 1999; Jones, 1999; Autio et al., 2000;
Bell et al., 2003). Theory in organizational learning suggests that knowledge is easier to develop when little to no organizational routines exist, as there is then no need to unlearn the existing knowledge that conflicts with the newly developed knowledge. Thus, new and young firms are well-positioned to learn and have a “learning advantage of newness” as they lack the deeply rooted routines that render internationalization more costly and difficult for established firms, which must unlearn embedded routines as they develop new knowledge (Autio et al., 2000).

As discussed earlier, the firm’s ability to develop new knowledge from its external environment or exploit existing knowledge in new contexts depends on the firm’s level of prior related knowledge (Cohen & Levinthal, 1990; March, 1991). This research looks specifically at medium-sized design firms whose knowledge is centralized and individualized in the founder or the entrepreneurial team, unlike in large multinational firms (Reuber & Fischer, 1997; Shrader et al., 2000). To date, most research have focused on large multinational corporations (Etemad, 2004). Thus, understanding the composition of the firm’s core team can provide valuable insight on the firm’s initial investment of resource and capabilities (Oviatt & McDougall, 1994) on which it may build its dynamic capabilities and competitive advantage (Eisenhardt & Martin, 2000).

Given that design firms provide designs that are highly customized and which are often co-created with the client, the design delivery process is generally completed in person on the site of the client’s project (Løwendahl, 2005; Reihlen & Apel, 2007). This approach means that the firm is highly dependent on its human capital (Løwendahl, 2005) as they are the means for the firm to transfer its intangible resources to foreign markets. However, through the export of its
designs, and the consequent expatriation of its employees, the firm enables its human capital to gain rich knowledge that it can absorb into its knowledge base (Cohen & Levinthal, 1990).

If firms are to renew themselves by the renewal of their resource base, they must make investments in their learning capabilities to obtain and assimilate new external knowledge (Zahra & George, 2002). Given that design firms depend on the trust and relationships they build with their suppliers, partners and clients, it is important to understand what kind of knowledge accumulation completed in international markets enhances the firm’s resource base and how this new knowledge is integrated into its existing knowledge base (Zollo & Winter, 2002).

As design firms work on project-based assignments, they often exit the country once the project has been completed (Coviello & Martin, 1999; Malhotra & Morris, 2009). This may lead to the repatriation of the acquired foreign knowledge because it is embedded in the expatriated employees. Authors suggest that exporting can influence firm outcomes beyond providing a sales opportunity for existing products and designs (Salomon & Shaver, 2005; Zahra et al., 2000). From a strategic perspective, firms operating in foreign markets may benefit from the repeated interactions and information exchanges encountered with various agents, such as distributors, intermediaries, competitors, clients and clients’ networks (Lindstrand, Eriksson & Sharma, 2009). Through these interactions, internationalized firms are exposed to valuable knowledge to which they would not have been privy were they restricted to their domestic market (Root, 1987). Thus, firms gain experiential knowledge (Zahra et al., 2000) of a technological, commercial and relational nature that can then be integrated and incorporated into existing production processes (Salomon & Shaver, 2005).
2.4 Impact of managerial cognition on the renewal of the firm’s resource base

The first section outlined this study’s theoretical framework by discussing the advancements in the RBV and DC perspectives. The firm’s resource base was discussed in detail and focus was given to defining and exemplifying resources, operational capabilities, dynamic capabilities, and higher-order capabilities. These components were explained to have equally important yet distinct implications for the strategic renewal of the firm’s resource base.

From the literature, it was concluded that for a firm to achieve a competitive advantage, it must exploit the differences in its available resources and capabilities that are not readily available to its competitors. Managerial cognition and dynamic capabilities were seen to be the drivers of new sources of competitive advantage, by way of modifying the firm’s resources and operational capabilities (Eisenhardt & Martin, 2000; Grant, 1996; Teece et al., 1997). The discussion continued by acknowledging that to create and modify these dynamic capabilities, the firm must have the appropriate managerial cognition to deliberately invest in learning capabilities, as identified by second-order capabilities (Winter, 2003). Thus, the study’s premise is that second-order capabilities (Vera et al., 2011), is an important sustainable competitive advantage a firm will need to develop because it leads to a continuous renewal of its resource base (De Geus, 1988). The proposed conceptual model encapsulates these dynamic relationships.
Figure 2.1 Managerial cognition and the capability assembly process (Adapted from Kaplan and Eggers, 2013)

The second section provided an overview of design designs within the greater scope of design firms. Three important value-creating processes were highlighted, as they provided a general sense of most consulting design firms’ business offering:

1) cognition of client need and subsequent sale of design to respond to client need;

2) design delivery activities to result in project completion; and,

3) continuous learning in the previous two processes to improve efficiency and effectiveness of future projects (Løwendahl, 2005).

Human capital was demonstrated to be the most important characteristic when studying knowledge-intensive design firms. In relation to the value-adding processes reiterated above, the firm’s human capital is the vehicle by which these
processes are completed. Several critical intangible resources and capabilities were described, furthering the evidence of the knowledge-intensive firm’s dependence on its human capital and the intangible knowledge assets they embody. These include the processes that are embedded in organizational routines such as the processes to accomplish projects (Løwendahl, 2005; Maister, 1993; Winter, 2003), the knowledge and expertise embedded in experts (Teece, 2003; Teece & Al-Ali, 2011) and support staff (Maister, 1993), and, most importantly, the firm’s ability to learn and integrate new knowledge and apply that which has been institutionalized (Crossan et al., 1999).

In alignment with the RBV and DC perspectives, the section concluded that managerial cognition significantly affects the resources and capabilities the firm needs to respond to environmental changes (Ball et al., 2008; Casillas et al., 2012). It was concluded that the resources and capabilities dedicated to or engaged in foreign market activities evolve differently depending on the firm’s level of involvement in its market activities.

From the conceptual model depicted in Figure 2, two propositions are proposed that are aligned with the theoretical framework discussed in Section 2.2.2. The following sections further discuss the model and propositions.

2.4.1 How changes in the external environment impact the renewal of the firm’s resource base

The firm can be viewed as a bundle of heterogeneous resources and capabilities that are both internal and external to it (Barney, 1991; Peteraf, 1993). These resources and capabilities include, for example, the founder and managerial team (Alvarez & Busenitz, 2001), their network of business and client relationships
(Elfring & Hulsink, 2003), their background and past experiences (Shane, 2000; Venkataraman, 1997) and their existing prior knowledge base (Shane, 2000; Venkataraman, 1997).

Not all resources and capabilities are developed or acquired the same way. Some may have been developed internally (e.g., the organization’s reputation, its project portfolio) while others are acquired (e.g., a client list through hiring a new expert on staff). From the earliest works on the RBV (Penrose, 1959), valuable, rare and costly-to-imitate resources and capabilities were identified as those on which a firm can build competitive advantage (Barney, 1991; Peteraf, 1993).

The accessibility to foreign markets and the advances in ICTs, provide opportunities for Singapore’s design firms to expand overseas to exploit their resource base to generate more rents from their valuable, rare and costly-to-imitate resources and capabilities. Although much of the literature describes expansion into foreign markets as a learning process (Eriksson & Chetty, 2003; Eriksson, Majkgard & Sharma, 2000; Hsu & Pereira, 2008), there have been few studies that address how knowledge gained from the firm’s activities is integrated into the firm’s existing knowledge base and, more importantly, what the changes resulting from these learning experiences are.

The RBT provides a useful framework to explain how firms diversify in design firms, as value is created through the selection, development and use of human capital (Hitt et al., 2006) and knowledge of global markets is increased via interactions in the firm’s networks (Yli-Renko, Autio & Tontti, 2002). Moreover, previous experience is an intangible resource that enables managers to recognize and develop knowledge of opportunities abroad and gives them insight into how to
manage relationships and operations in a foreign environment (Cohen & Levinthal, 1990; Sapienza, Autio, George & Zahra, 2006; Westhead et al., 2001). Firms whose design offerings require a certain degree of interaction with the customer must attain a level of sensitivity to the culture, beliefs, values and preferences of foreign markets (Hofstede, 1980.). This poses an additional difficulty for some design firms to engage in international activities, as barriers to entry are caused by a lack of understanding or knowledge of the target market. Again, this poses a direct threat to design firms, as the exchange of assets is usually intangible, even if embodied in a physical object. Relational capital in the form of trust, for example, is therefore a pivotal intangible resource that some firms must develop prior to finding acceptance and success in foreign markets (Uzzi, 1997). Thus, technological, commercial and relational capabilities are necessary for the firm to gather and prepare the valuable resources it needs for internationalization (Sapienza et al., 2006).

The objective of this study was to further our understanding of how managerial cognition drives organizational learning which impacts the firm’s dynamic and operational capabilities as a result of the knowledge gained from responding to environmental shifts. This is discussed further in the following sections:

2.4.2 Evolving capabilities from learning accrued in changing markets

Given the unique nature of designs, their ability to successfully recreate their design offering depends on whether the bundled resources that generate their competitive advantages can be transferred elsewhere in an efficient and effective manner, and whether those resources are in fact, compatible and relevant to other competitive markets (Sharma & Erramilli, 2004).
Often, the ease of transferability of resources and capabilities across foreign borders is underestimated. The firm may encounter difficulty in replicating its competitive advantage in other markets because of problems to recreate its dynamic capabilities, which are the organizational routines that modify operational capabilities and resources necessary to achieve new resource combinations (Luo, 2000).

Design firms find themselves confronted with a more complex relationship with their clients than manufacturing firms because client defection has been found to have a greater impact on profits than scale, market share, unit costs and other factors related to sustained competitive advantages (Reichheld & Sasser, 1990). Building relational capital, composed of trust, information transfer and joint problem solving (Uzzi, 1997) is necessary for these firms to protect themselves against the opportunistic use of the knowledge embedded in the provided design (Hitt et al., 2006). When looking specifically at the small and medium-sized design firms, trust-based relationships with long-time customers and repeat business were found to be critical to these organizations (Vanchan & MacPherson, 2008).

The quality of the relationship between a client and its design provider becomes a reflection of the client’s continued demand and its willingness to pay for the design (Saparito, Chen & Sapienza, 2004). The firm’s ability to understand and respond to customer needs is especially useful for designs firms, particularly for those with a high degree of interaction with customers and customization of design because the firm’s ability to respond to its clients may be developed as a source of competitive advantage.
Many scholars acknowledge that the evolution of the firm’s resource base is heavily shaped by the firm’s cognitive model as well as learning mechanisms developed within the firm (Eggers & Kaplan, 2013). Referring back to the hierarchy of capabilities (Arena & Lazaric, 2003; Collis, 1994; Winter, 2003) as discussed previously, Zollo and Winter (2002) suggest that “[d]ynamic capabilities arise from learning; they constitute the firm’s systematic methods for modifying operating routines” (Zollo & Winter, 2002, p. 340). Organizational learning is a path-dependent and socially complex process.

When firms compete in foreign markets, the knowledge they develop or acquire may significantly change their routines, tasks and procedures. Nevertheless, possessing of the new knowledge does not necessarily result in competitive advantage. Theoretically, firm competitiveness instead would come from the dynamic capabilities (Eisenhardt & Martin, 2000) that would enable the firm to create new knowledge and apply its existing knowledge base in novel ways (March, 1991). From the strategic management viewpoint, organizational learning is concerned with the renewal of the firm in the face of continually changing environmental challenges (Crossan et al., 1999). Researchers argue that managerial cognition of the process of learning is central to the assembly and renewal of dynamic capabilities (Zollo & Winter, 2002; Easterby-Smith & Prieto, 2008). Thus, the study posits that second-order capabilities created or modified during environmental change impact the firm by creating and modifying dynamic capabilities.

As the firm grows, changes occur in the firm’s resource base in terms of combinations and types of resources and capabilities. New needs may surface
and existing combinations of resources and capabilities may prove obsolete (Penrose, 2009). Path dependency is an important characteristic in the evolution of dynamic capabilities (Ambrosini & Bowman, 2009). A common assumption in dynamic capabilities is that the firm’s evolution is non-random and is dependent on its prior history. Thus, change in a firm is perpetually constrained and guided by its past actions and its resource base (Helfat et al., 2007). It is generally accepted by strategy researchers that dynamic capabilities by themselves do not lead to competitive advantage (Eisenhardt & Martin, 2000). Rather, the firm’s competitive advantage depends on the new configurations of resources and operational routines that result from modifications brought about by dynamic capabilities (Eisenhardt & Martin, 2000; Vera et al., 2011; Winter, 2003).

In a design firm, value is created via three processes: recognition of a client need and the subsequent sale of the service; service delivery activities resulting in project completion; and cognition and learning of the previous two processes to feed forward into and improve upon the efficiency and effectiveness of future projects (Løwendahl, 2005). The first two processes are operational capabilities which are contextual in nature and are driven by second-order capabilities as defined by learning and cognition. The strategy and cognition literatures provide some insights on how firms can modify them to enable firm competitiveness. By way of dynamic capabilities, these two operational capabilities can be modified or changed, based on the firm’s resource base, managerial cognition of past decisions, and the firm’s history. Crucially, routines and capabilities emerge only from managers’ particular understandings about how things should be done based on the knowledge accumulated from past experiences with previous projects.
Proposition 1:

Managerial cognition that encodes knowledge accrued from the operating environment will likely lead to the assembly and/or modification of dynamic capabilities and the subsequent modification of the firm’s operational capabilities.

The notion that capabilities and resources are accrued through experience builds on current work in organizational learning (Argote, Beckman & Epple, 1990) and asset accumulation (Dierickx & Cool, 1989). King & Tucci (2002) highlight that managerial choice of a strategy moderates the link between capabilities and performance. Helfat and Winter (2011) define a capability as having a “specific and intended purpose” and an understanding or interpretation of that purpose is therefore, central to the assembly of routines and resources into a capability. Salvato (2009) asserts that managers replicate past experiences by “mindfully” formalizing them into organizational routines. Helfat and Peteraf (2003) argue that the assembly of capabilities comes through an iterative process of trials and reflection by managers. Laamanen and Wallin’s empirical study shows that managerial cognition affect how capabilities are built by shaping choices about the capability development path that a firm takes. They demonstrate that capabilities are assembled from different sets of routines although they do not yet give us a sense for how the assembly from routines happens.

Recent research suggests that the transformation of routines into capabilities is supported by two cognitive processes: identifying the purpose for which capabilities are applied and interpreting what the firm can do with them (Eggers &
Kaplan, 2013). Purposes arise because managers perceive an organizational weakness or external threat. The learning literature on problem recognition indicates that managers must be aware of a gap in performance relative to strategic goals in order to generate learning about the nature of the problem (Baumard & Starbuck, 2005; Eggers, 2012; Haunschild & Sullivan, 2002). Danneels (2011) describes managerial understanding of the organization’s existing resources and their potential to be deployed in new tasks as “resource cognition”. Academics and practitioners acknowledge that an important cognitive aspect of capability assembly is managerial understanding of the firm’s resources, routines and capabilities (Eggers & Kaplan, 2013; Danneels, 2013; Marino, 1996). It is proposed that managers utilized their cognition of the firm’s strategic goal to shape their understanding of the potential value of the routines that the firm possessed and this vision of managerial alertness may provide the necessary purposeful and interpretive process for capability assembly to occur at the firms. This leads us to the following proposition 2a:

**Proposition 2a:**

**Managerial cognition of capability purpose is antecedent to the assembly of dynamic capabilities.**

It is further proposed that the second cognitive antecedent to capability assembly is derived from managers’ understanding of what the firm can do with capabilities that it does or does not possess (Eggers & Kaplan, 2013). Managers may build new routines through sustained interaction with other team members to be cognitively encoded into tacit knowledge about how managers may complete certain tasks. This process would therefore, help managers to understand the
relevance and usefulness of capabilities within the firm (Cohen & Bacdayan, 1994). Therefore, faced with environmental shifts, managers will draw on these cognitive processes in order to assemble routines into a particular capability to address that opportunity or threat. This leads us to the following Proposition 2b:

*Proposition 2b:*

*Managerial cognition of capability salience is antecedent to the assembly of dynamic capabilities.*

The conceptual model and propositions above provide the basis for the development of the research methodology which will be described in the next chapter.

**2.5 Chapter Summary**

This chapter has presented an overview, review of the literature on the RBT, DC, learning and managerial cognition. It articulated the conceptual framework to be used in the study. From there, the conceptual model and propositions are drawn which will be further explored. The next chapter will present the research design and methodology.
CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction
The main objectives of this chapter are to describe the research design and to outline the detailed research methodology that will be followed in conducting the research. The chapter will also discuss the ethical considerations governing the study.

3.2 Overview
Chapter 2 reviewed prior literature on service firms, managerial cognition, and the RBT and DC frameworks. Although the literature argues that managerial cognition enables learning which in turn renews and modifies a firm’s resource base, we have a limited understanding of how the knowledge accumulated from a firm’s competitive activities is absorbed into the firm’s existing resource base and what the resulting changes subsequent to these learning experiences are. Advances in the RBT and DC constructs propose theoretical relationships between managerial cognition and the assembly and/or modification of the firm’s resource base components. This study posits that these relationships may explain the impact that managerial cognition has on the firm’s resource base renewal process, as it pertains to the how a firm responds to environmental challenges and makes subsequent changes to its dynamic and operational capabilities. However, these relationships remain unexplored within the context of the design industry in Singapore undergoing rapid socio-economic changes in recent years. Thus, the key question is how do environmental change impact
managerial cognition and the firm’s ability to learn and adapt firm resources and capabilities to compete?

The aim of this thesis is to provide evidence through case studies of the relationships that exist between 1) managerial cognition and learning; 2) managerial cognition and changes to dynamic capabilities; 3) managerial cognition and changes to operational capabilities.

The research tries to reduce the gap between abstraction of the RBT and DC constructs and empirical verification, which is lacking in the strategy literature to date. The study is confirmatory in nature as it is driven by the propositions that were defined, developed and justified in the literature review. Following a case study research design (Yin, 2009), the data analysis is hypothesis-driven and the study looks to confirm or disconfirm the outlined propositions. Prior to elaborating the adopted analytical procedure, this section first begins by explaining the philosophical underpinnings, the research design and justifying the choice of a multiple case study approach.

3.3 Philosophical underpinnings of the research design

There has been considerable emphasis in the literature on justifying the philosophical stance adopted for a given research design (e.g., Hunt, 2003; Peter, 1992) as failure to think through philosophical issues can impact the quality of management research (Easterby-Smith, Thorpe, & Jackson, 2008). Clarification of the philosophical position helps the researcher to understand the assumptions underlying the research, including the assumptions about how the world is (ontology) and how we come to know it (epistemology). This in turn helps address the philosophical issues to situate the research within an appropriate research
paradigm. The boundaries that demarcate the researcher’s ontological, epistemological and methodological premises may be termed as a paradigm, which essentially is a “basic set of beliefs that guides action” (Guba, 1990, p.17).

This research is situated within the post-positivist paradigm which works within a critical realist ontology and objectivist epistemology using qualitative methodologies (Lincoln & Guba, 2003, p. 256). The ontological position of critical realism holds the view that science must critically evaluate and test its knowledge claims to determine their truth content (Hunt, 2005), while the objectivist epistemological position holds the view that the findings are probably true (Lincoln & Guba, 2003, p.256). The critical realist position is a fundamental tenet of the philosophical perspective of scientific realism (Hunt, 1990, 2003). Although strategy research does not subscribe to a dominant philosophy (e.g., Hunt, 2002), the literature suggests that many strategy researchers have implicitly accepted scientific realism as the dominant discourse. Hunt (2003) argues that in contrast with many other philosophies, “it produces an intelligible, coherent discourse about science” (p.285). Next, significant aspects of scientific realism in relation to truth and strategy research are first discussed, followed by its application within the context of the current research.

Scientific realism views the world as external and holds that it can only be known in terms of incomplete descriptions and discourses (Tapp & Hughes, 2008). This perspective holds that truth is the overriding objective of strategy theory and research and that science can come to know the real world, though not with certainty. A key proposition in scientific realism is that knowledge claims must be critically evaluated and tested, has important implications for the current study.
which aims to explore the managerial cognition that impact upon a firm’s capability to learn and renew its resource base.

3.4 Case study research design

The case study as a research method has gained considerable popularity in strategic management. Over the course in which the field has evolved, a multitude of studies examining topics related to the service firms have adopted the case study methodology (e.g., Johanson & Weidersheim, 1975; McDougall & Oviatt, 1994; Boter & Holmquist, 1996; Coviello & Martin, 1999; Bell, et al., 2001; Chandra, Styles & Wilkinson, 2009; Schweizer, Vahlne & Johanson, 2010). Since service firms have inherently unique characteristics (Coviello & Martin, 1999), case studies provide the depth and richness necessary to understanding a phenomenon within the context in which it is placed. This method allows researchers to “understand a complex social phenomena” while retaining the “holistic and meaningful characteristics of real-life events—such as individual life cycles, organizational and managerial processes” (Yin, 2009, p. 4).

Yin’s (2003) approach to case studies differs from other qualitative modes of inquiry such as grounded theory (Eisenhardt, 1989; Glaser & Strauss, 1967; Strauss & Corbin, 1998) because it requires the researcher to begin by developing a set of theoretical propositions from the literature prior to the data collection. The use of theory and propositions at the onset of data collection serve two important purposes. First, they offer a blueprint for the data collection process, which restricts the investigator to the research question. The investigator is therefore not tempted to examine everything, as case study research is often rich and heavy in data. In the case of this particular study, the use of theory and
propositions ensured that the researcher focused on examining particular relationships theorized in the literature that provide explanations for managerial cognition, learning and subsequent resource base renewal. As this is a broad and complex phenomenon, the use of theoretical propositions and the development of a theoretical model were valuable and helpful mechanisms that enabled focus in the data collection and analysis stages. Second, the theory and propositions act as a means to generalize the results of the case study, as the previously developed theory can then be used as a template with which to compare the empirical results of the study. This particular study adopted an explanatory case study design because the research question and sub-questions deal with relationships that need to be traced over time. This type of case study aims to present data that explains how events occurred and reflects a “cause and effect relationship” (Yin, 2009).

Following Yin (2003, p. 8), the choice of research design was based on three conditions: (a) the type of research question posed, (b) the extent of control the investigator had over actual behavioral events, and (c) the degree of focus on contemporary as opposed to historical events. First, the case study approach was determined to be the most appropriate as the research questions asks how changes in the environment impact managerial cognitions and the firm’s resource base renewal over time. The secondary research questions, as defined by the research objectives, seek evidence of relationships between resource base components and ask why change and evolution can be observed in these components. Second, the researcher did not require nor did he have control over the actual behavioral events. Third, the study focused on a phenomenon (resource base renewal) that is continuous and recurring in organizations;
therefore, the events under study are relatively contemporary in nature and important to the design industry in Singapore.

3.5 Conducting the Research

This next section describes the research process and demonstrates how the researcher followed and applied the procedures outlined in Yin’s (2009) case study research guide. The research process was divided into three phases that describe the researcher’s actions (Table 3.1):

a) define the study parameters, the research question, and the research design;

b) prepare for data collection, conduct the data collection and begin the qualitative data analysis;

c) complete the data analysis (within-case and cross-case analysis), conclude based on results, and relate the study’s findings to the contemporary literature.
Table 3.1: Description of Case Study Research Approach

<table>
<thead>
<tr>
<th>Phase</th>
<th>Key Steps</th>
<th>Description of Actions Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define research parameters and research</td>
<td>Define the research question and the unit of analysis</td>
<td>How do environmental changes impact managerial cognition and the firm’s ability to learn and adapt firm resources and capabilities to compete?</td>
</tr>
<tr>
<td>design</td>
<td></td>
<td>Unit of analysis: the firm and its resource base components.</td>
</tr>
<tr>
<td>Establish the theoretical context of the</td>
<td>Proposions were brought forward in line with the managerial cognition</td>
<td></td>
</tr>
<tr>
<td>study based on the literature and advance</td>
<td>literature and advancements in the RBT and DC literature.</td>
<td></td>
</tr>
<tr>
<td>propositions for testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determine the research design, create a</td>
<td>Multiple case study, design firms in the design industry in Singapore,</td>
<td></td>
</tr>
<tr>
<td>case study protocol, specify the population</td>
<td>information-oriented and sampling strategy for experiment-like replication</td>
<td></td>
</tr>
<tr>
<td>under study, choose sampling strategy</td>
<td>logic.</td>
<td></td>
</tr>
<tr>
<td>Prepare and conduct data collection, and</td>
<td>Select cases following sampling strategy and begin analysis</td>
<td>Four cases for literal replication and one case for theoretical replication.</td>
</tr>
<tr>
<td>begin analysis</td>
<td>Conduct data collection</td>
<td>Interviews were completed with three respondents in each company- managing partner/director, project/design director, and a third participant. Company documents and other publicly available information gathered in the data collection stage.</td>
</tr>
<tr>
<td>Map chronology of events for each case and</td>
<td>A timeline was created for each case to map the chronology of perceived</td>
<td></td>
</tr>
<tr>
<td>transcribe the interview recordings</td>
<td>critical events. All interviews were transcribed by the researcher. All</td>
<td></td>
</tr>
<tr>
<td>Complete analysis and report on findings</td>
<td>linked case study data to study propositions to confirm or disconfirm</td>
<td></td>
</tr>
<tr>
<td>and conclusions</td>
<td>theoretical relationships with gathered evidence.</td>
<td></td>
</tr>
<tr>
<td>Analyze case study data (within-case and</td>
<td>Cross-case conclusions were drawn and compared the emergent findings with</td>
<td></td>
</tr>
<tr>
<td>cross-case analysis)</td>
<td>conflicting and supporting literature. Refined the initial conceptual</td>
<td></td>
</tr>
<tr>
<td>Draw cross-case conclusions and refine</td>
<td>model and propositions</td>
<td></td>
</tr>
<tr>
<td>initial conceptual model and propositions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write cross-case findings and draw</td>
<td>Cross-case findings and drew conclusions.</td>
<td></td>
</tr>
<tr>
<td>conclusions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Yin (2009).

3.5.1 Define the Research Parameters and the Research Design

3.5.1.1 Define the research question

The study’s research question sought to explore and provide evidence of
relationships between the managerial cognitions, organizational learning and the renewal of its resource base components, i.e. dynamic capabilities, operational capabilities, and resources. Thus, the study focuses on the following research question: *How do changes in the external environment influence managerial cognition and the firm’s ability to learn, assemble and modify its resources and capabilities?* To answer this question, three research objectives were identified.

**Table 3.2: Research Question and Research Objectives**

<table>
<thead>
<tr>
<th>Key research question</th>
<th>How do changes in the external environment influence managerial cognition and the firm’s ability to learn, adapt and modify its resources and capabilities?</th>
</tr>
</thead>
</table>
| Other research questions | 1. How do changes in second-order capabilities impact dynamic capabilities?  
2. How do changes in second-order capabilities impact operational capabilities? |
| Research objectives | - Assess how external changes impact managerial cognition and knowledge accumulation (learning);  
- Assess changes in dynamic capabilities;  
- Assess changes in operational capabilities. |
### Table 3.3: Stages in theory development

<table>
<thead>
<tr>
<th>Analytical goal</th>
<th>Raw data used</th>
<th>Analytical procedures and its outcome</th>
<th>Implication for new theory development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe patterns in the company</td>
<td>Feature articles, industry reports, company memos, project documents, and minutes</td>
<td>Thematic analysis. Produce timelines of events in case firms</td>
<td>Understanding in firms with different backgrounds and capabilities causing them to converge or diverge</td>
</tr>
<tr>
<td>Identify capability development actions and resulting capabilities</td>
<td>Case histories, company reports, web research, industry reports, memos</td>
<td>Coding of different types of capability actions according to broad capability category to break down and reconstruct data</td>
<td>Simultaneous actions on multiple capabilities depending on what is perceived as important and now managerial attention is allocated to different capabilities</td>
</tr>
<tr>
<td>Unearth the dynamics between managerial cognitive intent, actions and changes in capabilities</td>
<td>Informal discussions with some members of the managerial team.</td>
<td>Coding of the different changes in capability development actions into timeline</td>
<td>Capability assembly shift and modify to respond to environmental change</td>
</tr>
<tr>
<td>Identify capability assembly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Identify capability purpose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Identify capability salience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examine formation of cognitive intent and develop overall theoretical framework</td>
<td>Interviews with company founder or managing partner and members of the managerial team</td>
<td>Revise and update framework accounting for managerial action in creation and modification of capabilities</td>
<td>Same cognition can cause bundled changes on different capabilities over time.</td>
</tr>
</tbody>
</table>

#### 3.5.1.2 Define the unit of analysis

The process by which the firm renews its resource base is one that is both continuous and evolutionary (Nelson & Winter, 1982). The relationships that exist between the different components of the firm’s resource base provide a theoretical explanation for the firm’s evolution and change over time (Easterby-
Central to this theme is the firm, which was identified as the unit of analysis for this study. Following RBT and DC logic, the various components of the firm’s resource base are also of particular interest and marked as units of analysis (Teece et al., 1997). These allowed for the firm to be conceptualized as a unique bundling of resources and capabilities. As such, the examination of their reported change over time could provide preliminary evidence of the relationships between managerial cognitions and the various components of the firm’s resource base.

The use of many or particular components of the firm’s resource base as units of analysis is an emerging approach in strategy research as more scholars adopt the RBT and DC perspectives. Within the context of this study, observing the components of the firm’s resource base further countered the issue of heterogeneity among the studied service firms.

### 3.5.1.3 Sample and unit of analysis

A multi-firm field study using a diverse sample of design service firms located in Singapore was conducted. Using theoretical sampling, Hutchinson’s (1993) recommendation of a wide, diverse sample which ensures inclusion of extensive data that covers a wide range of issues/behavior related to the phenomenon was followed until ‘theoretical saturation’ – a point where no additional data is being found and the category becomes stable and rich in detail (Glaser & Strauss, 1967). The gathered information included the general nature of the business operations, the history, the management team, the number of employees, the firm’s contact details, etc. This information was supplemented by the information available on the firm’s
website and was also confirmed during the interview process.

3.5.1.4 Establish the theoretical context of the study

The literature review begins with a detailed explanation of the study’s theoretical framework. In line with those conclusions and the identified gap in the literature, two main propositions were brought forward from the strategy literature. These propositions explore how managerial cognitions influence knowledge-based competences to impact patterns and outcomes” and are aligned with contemporary research published in the literature on strategic cognition (Kaplan and Eggers, 2013; Barrales-Molina et al 2010; Ambrosini, et al., 2009; Marcel et al, 2010). Furthermore, these propositions empirically examine revisions to the RBT and DC perspectives to include second-order capabilities (Vera et al., 2011; Eastherby-Smith & Prieto, 2008) which to date, have received little attention in the literature. The conceptual model built from the literature review and the propositions were used to guide and structure the data collection and analysis phases.

3.5.1.5 Specify study population

In Singapore, the average design firm (which employ up to 100 people) account for 85% of all design firms and contributed about 77% of the industry’s value in 2012, in terms of gross domestic product (Singapore Government Statistics, 2012). Most design firms feature independent ownership and operations, including close control and centralized decision making by owners/managers. In addition, the smaller and medium-sized firms often lack sophisticated decision support systems (Heyden et al., 2013). Instead, a central decision maker, such as the founder, or managing director, usually is responsible for initiating
innovations or organizational changes. Such senior managers exert disproportionate influences on firm decisions and participate in a fluid mix of strategic, tactical and operational choices (Powell et al., 2011). In turn, decisions by senior managers tend to permeate the organizational processes of these design firms (e.g. Boone et al., 1996; Simsek et al., 2010).

Another common trait of the mid-sized firm is its agility and flexibility (Dainty et al., 2001), yet this strategic advantage also creates a significant challenge, in that the firm must constantly scan its external environment (Reichstein et al., 2005), react to changes in that environment with appropriate strategic responses (Love and Irani, 2004; Packham et al., 2005), ensure constant technological renewal (Jones et al., 2011) and conduct R&D, all with limited financial and human resources. These traits strongly impede the smaller firms’ capability to innovate (Cobbenhagen, 2000). Yet to remain competitive, firms generally need to develop innovation capabilities (Gann, 2000; Sexton and Barrett, 2003).

Thus, the choice to study design services firms in Singapore is one based on the current reality of Singapore’s economic landscape as it experiences rapidly shifting socio-economic changes. It is an important sector in the Singapore economy from which we can develop a greater understanding of the impact of environmental shifts on managerial cognition which influences the regeneration of the firm’s resource base.

Firms operating in the design industry have been considered for this study to keep the collected data homogenous to one population group and to allow for the potential for insights to be transferable to other similar populations (Miles &
Huberman, 1994). This decision is aligned with organizational ecology, which argues that populations are distinct and should be studied one at a time (Carroll & Hannan, 2000).

3.5.2 Prepare and Conduct Data Collection and Begin Analysis

3.5.2.1 Select cases following sampling strategy

This study adopted a theoretical sampling strategy. Multiple cases were chosen based on their contribution to the theory development within the set of cases (Eisenhardt & Graebner, 2007). These were chosen to facilitate replication and extension of theory (literal replication) or for contrary replication and to eliminate alternative explanation (theoretical replications) (Yin, 2009).

For literal replication, cases were chosen to predict similar results for predictable reasons. Four cases of knowledge-intensive design firms from the design sector were selected. These firms had expanded overseas due to domestic competitive pressures, the nature of the services they offer and to accommodate clients that had projects in foreign markets. For theoretical replication, cases were selected to produce contrary results for predictable reason. The fifth case (Company C) did not have continual work in foreign markets but had embarked on a strategy to penetrate emerging markets.

To ensure proper bounding of the case, firms of fewer than 100 employees were selected as this is the size criterion for mid-sized firms in Singapore (Industry Singapore, 2012). Firms with varying levels of local and foreign presence were chosen to allow for replication logic (Yin, 2009). Mid-sized firms (between 50-200 employees) were chosen to provide a sample of the case contexts. As described in the literature review, firm size in the service industry
impacts resource availability, especially in knowledge-intensive service firms where knowledge and human capital are valuable and critical resources. The cases were selected for theoretical reasons that allowed for experiment-like theoretical replication logic (Yin, 2003). This chosen approach to case selection allowed for a close look at a relatively small number of firms that provided an initial illustration of firms in the targeted population and enabled preliminary analytical generalization.

Firms had annual aggregate ongoing project values of between $50 million and $100 million. Also, mid-sized firms were selected because it is easier to observe the interactions of the RBT and DC constructs at play at these firms than in very small or very large firms. Small firms have unsophisticated organizational processes while large firms can be overly complex. Critically, mid-sized design firms were selected because they form the lifeblood of the design industry in Singapore, being crucial to the country’s economic growth and sources of employment (Spring Singapore, 2012; Collinson & Houlden, 2005; Radas & Bozic, 2009). Ninety-nine percent of all businesses in Singapore are Small and Medium Enterprises (SME); they employ seven out of every ten workers and contribute nearly half of Singapore’s national Gross Domestic Product (Spring Singapore, 2012). Also, the selected mid-sized firms were among those that industry experts have predicted will be driven to failure by the entry of large, scalable, foreign rivals forcing consolidation in the local industry following the removal of regulatory protection beginning in 2001. Since then many of these firms have gone on to build strategies that enabled them to succeed locally while expanding outwards into new regional growth markets.
The original methodology to select successful firms that satisfied the above criteria required that financial and economic data to be obtained from the firms. However, since there was little publicly available financial data on the local design industry, coupled with the fact that those firms that had been contacted initially were reluctant to release any financial data about their firms, the method was discarded.

Subsequently, three architects and a design industry expert, whom this researcher had worked with previously in the Urban Redevelopment Authority of Singapore, were contacted to help identify private firms that were appropriate for the current research. The researcher tried to focus these discussions on the capability of these firms to generate value for clients, capture new markets and adapt to changing environments – criteria relevant to the RBT and DC. This procedure yielded seven potential case firms. Data on these firms was then gleaned from secondary sources including industry magazine, newspapers, trade news and firm webpages, to ensure that they satisfied the selection criteria. Principals of the firms were then approached to participate in the research project. Five firms agreed on assurances that the research outcomes would be shared with them. Five firms agreed on condition of anonymity and assurances that the research outcomes would first be shared with them. To preserve the anonymity of the firms, each firm was identified only by a cryptogram. Table 3.4 provides a summary description of the cases and Table 3.5 provides information on managers in the interview sample.
**Table 3.4: Summary of case firms in the study**

<table>
<thead>
<tr>
<th>Factors</th>
<th>FIRMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td><strong>Project values in 2011</strong></td>
<td>S$60m</td>
</tr>
<tr>
<td><strong>Mature</strong></td>
<td>Mature</td>
</tr>
<tr>
<td><strong>Staff strength</strong></td>
<td>50</td>
</tr>
<tr>
<td><strong>Origination</strong></td>
<td>Family business</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>Partners</td>
</tr>
<tr>
<td><strong>Markets</strong></td>
<td>Domestic and foreign</td>
</tr>
<tr>
<td><strong>Client mix</strong></td>
<td>Diverse</td>
</tr>
<tr>
<td><strong>Growth Objectives</strong></td>
<td>Aggressive</td>
</tr>
<tr>
<td><strong>Reasoning</strong></td>
<td>Literal replication</td>
</tr>
</tbody>
</table>
Table 3.5 - Information on managers in the interview sample

<table>
<thead>
<tr>
<th>Manager</th>
<th>Title</th>
<th>Age</th>
<th>Responsible for or area of expertise</th>
<th>Years in the industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1</td>
<td>55</td>
<td>Strategic view of firm, design director</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>A2</td>
<td>53</td>
<td>Client and competitor knowledge</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
<td>50</td>
<td>Skills, organizational learning</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>B1</td>
<td>52</td>
<td>Strategic view of firm, design and management</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>B2</td>
<td>43</td>
<td>Product and design development, innovation</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td>B3</td>
<td>38</td>
<td>Skills, organizational learning, knowledge within the firm</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>C1</td>
<td>47</td>
<td>Strategic view of firm, managing projects</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>C2</td>
<td>46</td>
<td>Skills, knowledge within the firm</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>C3</td>
<td>41</td>
<td>Client and competitor and environmental knowledge</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>D1</td>
<td>47</td>
<td>Strategic view of the firm, design specialty</td>
<td>20</td>
</tr>
<tr>
<td>11</td>
<td>D2</td>
<td>39</td>
<td>Design and innovation</td>
<td>15</td>
</tr>
<tr>
<td>12</td>
<td>D3</td>
<td>36</td>
<td>Organizational skills, firm know-how</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>E1</td>
<td>52</td>
<td>Strategic view of the firm, client relationships</td>
<td>26</td>
</tr>
<tr>
<td>14</td>
<td>E2</td>
<td>47</td>
<td>Organizational learning, internal skills</td>
<td>21</td>
</tr>
<tr>
<td>15</td>
<td>E3</td>
<td>49</td>
<td>Client and competitor knowledge</td>
<td>23</td>
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3.5.2.2 Conduct data collection

- In-depth semi-structured interviews

The main source of data in this study was semi-structured interviews. These were completed with three individual for each studied firm. In all cases, the managing partner or director participated in the study. In all cases, this person was responsible for the firm’s strategy and had a strong understanding of the firm’s involvement in the domestic and foreign over the time of his/her tenure. The other interviewees were managers from different functional areas who would have been with the case firms for at least five years at the time of the interview since the nature of the interview questions involved on managerial cognition and firm strategy. It was important that the interviewees selected were senior managers who would have the strategic and operational insights to adequately answer the strategy questions put forth to them. In all cases, respondents were chosen by the managing partner/director of the firm. Also, managers were selected from different functional areas of the firms to enable a broad collection of rich details since each respondent would provide a different viewpoint on a particular issue given his/her own managerial cognition. Confidence in the research findings would be enhanced if they were corroborated by two or more managers. Table 3.5 comprises a list of the fifteen managers interviewed, their roles within the firm and the number of years of experience in the industry. The average experience level of the managers in the industry is 19 years. All interviewees are involved with charting of the strategic course of their firms.

The interviews

Respondents were contacted via their e-mail addresses that were obtained from the firms that had agreed to participate in the research. The e-mail contained an
introduction to the researcher, a brief overview of the research, and a request for participation by managers. It also included the option to receive more information about the study. If additional information was requested, a copy of an Information and Consent Form was forwarded to the potential participants. This document outlined in more detail the nature of the research, the types of participant involvement, possible risks and benefits to the participant, confidentiality of the data, feedback protocol, and the contact details for the researcher, supervisor and the CSU Human Research Ethics Committee in case further information was required.

The interviews were conducted in Singapore between November 2010 and January 2011. In total, fifteen managers were interviewed and it was agreed that participants would be provided with a copy of the final report. Participants accepted the use of a voice recorder and the researcher ensured that disturbances were kept to a minimum during the recorded interview. Each interview began with an introduction outlining the researcher’s background, interest, and the overall relevance to the research topic. This allowed the participant the opportunity to respond by expressing his or her interest in the research, to raise issues at the start of interview and to understand the subject at hand.

The interview was conducted along the lines of the interview guide. It was important to identify and pursue relevant lines of questioning whenever the opportunity arose. The interview guide was designed to allow for this flexibility. The researcher’s ability to establish a rapport with managers and gain their confidence was important. Questions were formulated based on personal experiences in the industry to exhibit an intimate knowledge of integral aspects of
the industry. This enhanced the quality of data obtained since managers were more willing to provide detailed responses to questions and explain causal relationships between variables.

The importance of recoding interviews was demonstrated by the richness of participants’ comments, the propensity to jump to related issues and the length of the responses. Conducting the interview in a semi-structured manner was considered most appropriate and a frank description of the research process was provided to participants.

Respondents were asked to reflect upon and describe the changes that had occurred in their firm during and subsequent to major external events. When analyzing change, key interests such as deadlines, projects, milestones and crisis situations are the triggers (Gersick, 1991). The use of a timeline gave sense to the relationships between events. The timeline was a complementary tool to the interview protocol, and the majority of participants noted that it was easier to recall the order of events with the use of this tool. The interview protocol was revised following the initial interview to correct and revise questions based on the ease with which participants understood what was asked during the discussion. The final interview protocol was adopted for all subsequent interviews. The interviews covered topics such as prior history of the participants and the firm, and a historical account of the firm’s involvement in domestic and foreign markets of perceived importance. When discussing the major events, interviewees were asked to discuss the changes in their perceptions and to their firm that had occurred subsequently, what they had learned from their experiences, and how that had an impact on their strategy and future. These interviews sought to capture crucial recollected information with regard to the firm’s resources and
capabilities, and how they had evolved throughout their firm’s involvement in the local and foreign markets.

Retrospective accounts provided by the respondents provided the basic building blocks to gain insights into the firm’s managerial cognition, resources, routines and dynamic capabilities. There were a couple of instances during the interviews where respondents indicated that they would like some of the recorded information to be deleted. The respondents were then reassured that the particular information would be deleted and a copy of the transcript would be sent across for verification. They were also informed that the information would be de-identified and remain confidential. Such reinforcement of privacy and confidential codes are important to establish trust during the interviewing process (Ryen, 2004). Finally, the study followed an emergent design method (Taylor & Bogdan, 1984) by which questions were added, deleted and modified throughout the research process.

To assess the model advanced here, and its associated propositions, the study’s approach is to assemble data from multiple sources, including multiple informants and archival documents, to triangulate findings and maximize reliability. Essential to this approach, is the establishment of a chain of evidence of the assembly of dynamic capabilities in these firms.

**Other data sources**

Additional data were collected so that the context of the cases could be properly depicted and analyzed. Requested documents included internal memos, quarterly reports, yearly objectives and assessment appraisals. Another source of data used was secondary public information, including the firms’ websites. These data sources were used to triangulate information captured during the interviews and
corroborate information provided by participants (Miles & Huberman, 1994; Yin, 2009).

**Memos**

Memos were used as a primary sense-making tool during the data collection and data analysis processes (Miles and Huberman, 1994). The investigator wrote summaries of the important themes and ideas that emerged from the cases as she was completing the coding of interview transcripts and company documents. These were particularly helpful to keep track of thoughts and ideas that were later used during the writing of the within-case and cross-case analyses.

**3.5.2.3 Chronology of events for each case and transcribe the interview recordings**

The interviews were transcribed and analyzed following coding procedures prescribed by Miles and Huberman (1984). Coding was followed to enhance internal validity (Pandit, 1995) and is understood here as “representing the operations by which data are broken down, conceptualized and put back together in new ways” (Flick, 2002). The interview recordings were played back and transcribed verbatim. Once transcribed, the researcher played back the recordings and reviewed the transcription work to ensure the accuracy of the data. Timelines were then reconstructed with the events that were written down during the interviews. These data points were supplemented with additional information gathered from the interviews as the investigator listened to the digital recordings and reread the transcripts. The transcripts and timelines were sent to the participants for confirmation of the integrity of the information and clarification, if need be.
3.5.2.4 Organize data in research database

To counter difficulties in data management during the analysis process, the investigator created a research database. The use of NVIVO 10 allowed the researcher to organize all sources of data (e.g., internal documents, interview transcripts and recordings, press releases, web pages, memos) in a way that enabled sophisticated reporting and query functions supported by the software.

3.5.3 Complete Analysis and Report on Findings and Conclusions

3.5.3.1 Within-case analysis

Once the data was entered into a study database, the researcher began the data analysis process by first completing the within-case analyses. This analysis strategy initially relied on the theoretical propositions identified prior to the data collection such that it provided a theoretical orientation to process. This analysis had two objectives. First, the investigator sought to confirm or disconfirm each proposition for each case by following the research sub-questions: How do managerial cognitions influence second-order capabilities and the subsequent change to dynamic capabilities and operational capabilities. Second, the researcher analyzed the transcripts to identify new themes, factors or processes that emerged in each individual case.

Thus, the coding process was first aimed at linking case data to the theoretical propositions. To do so, the theoretical framework components were used as initial pattern codes. As a result, categories in the coding scheme were created deductively based on the theoretical framework developed from the literature (Yin, 2009). The initial pattern codes were created from a priori codes identified in the literature review and from the concepts in the theoretical framework and propositions. Additional ‘grounded codes’ also emerged during the initial coding
phase and these gave way to new themes that were different from those uncovered in the literature review. Themes and patterns were indexed by linking similar data to the same phenomenon. Thematic ideas and concepts defined each code category and a definition provided examples with which to compare data to be included in that category. As a result, the code definitions in the coding scheme provided consistent guidelines during the coding process.

The analysis process began by coding the interview that the researcher considered the most complete. This was done to test the pattern codes generated from a priori codes and derived from the theory. New themes emerged as all transcripts and other data sources were coded in a first wave of analysis. In addition, as the research question and propositions examined the relationships between the multiple components of the firm’s resource base, it was important to incorporate a means to identify and track causal evidence between categories throughout the coding process. Thus, the identification of causal (e.g., ‘since’, ‘because’, ‘as’) and logical (e.g., ‘implies’, ‘means’, ‘therefore’, ‘consequently’) connectors as a sign of relationship between coded elements was used as a support for confirmation or disconfirmation of the propositions. These preliminary codes were reviewed and recoded according to the relationship they presented between resource base components: managerial cognition and learning and changes to dynamic capabilities; learning and changes to operational capabilities.

Upon completion of this first stage of coding, the data was recoded to ensure all data had been analyzed with the coding scheme that incorporated emergent themes. Thus, all data were systematically coded after sufficient consistency in code categories was achieved (Weber, 1990). Upon finishing a second stage of coding, the coded excerpts were revised to ensure that the coded data followed
the category definitions and verify the reliability of the coding process. This step countered human fatigue during the coding process and ensured that the investigator’s understanding of the categories and coding rules had not change subtly over time (Miles & Huberman, 1994; Weber, 1990).

A third stage of coding was then completed, whereby the researcher revised the excerpts from all the themes and identified more detailed and particular concepts. During this coding stage, themes were identified from both concepts found in the literature review and new emerging themes.

3.5.3.2 Cross-case analysis

The purpose of the cross-case analysis was to facilitate a comparison of the commonalities and differences between the five cases. Cases were treated as a series of experiments and each case was used to either confirm or disconfirm the proposition from the theoretical framework and emerging themes. In all cases, the following relationships were investigated:

1. Operating environment and managerial cognition
2. Managerial cognition and organization learning
3. Managerial cognition and capabilities
4. Learning, experience and capabilities

Analytic manipulations in NVIVO were used to help make sense of case data during the cross-case analysis (Miles and Hubberman, 1994). Two analytical techniques were followed: pattern matching and explanation building. The researcher began by reviewing the descriptive data gathered and organized in the within-case analyses. To complete pattern matching, pieces of information from the same case pertaining to the same element of inquiry (relationship 1, 2 or 3)
were examined to confirm or disconfirm each proposition. Findings from each case were compared to one another to examine whether the data provided support for literal and theoretical replication.

Explanation building was then used to refine the theoretical propositions. The initial propositions were tested in a first case; statements reflecting the findings pertaining to each proposition were created based on the case data. These statements were tested in the second, third, and fourth case in an iterative sequence to refine the propositions and theoretical model. The revised statements were then compared to findings from the literature. This comparison is discussed in the results chapter.

3.6 Validity and Reliability Issues

Yin (2009) defines four tests that are used to evaluate the quality of a given research design. They are construct validity, internal validity, external validity and reliability and are shown on Table 3.5. These elements exist to compel the researcher to follow “best practice” in case study design such as the use of multiple sources, replication logic and having respondents review case reports (Yin, 2009). The four tests utilized in the current study are described below:

3.6.1 Construct validity

To ensure construct validity, it is necessary to establish the correct measures for the phenomenon under study (Yin, 2009). The definition and operationalization of all constructs (i.e., organizational learning processes, knowledge types, dynamic capabilities, and operational capabilities) were grounded in the literature review. Following Yin’s (2009) suggestions, the study gathered multiple sources of data to triangulate evidence between sources when possible. These included interviews, memos, company documents and other data sources such as
information found on the firms’ websites. In addition, participants were asked to review the draft case study report and generated timeline. This step was completed to ensure the integrity of the reported data.

3.6.2 Internal validity

Internal validity is of concern in exploratory studies as they pertain to exploring causal relationships (Yin, 2009). Thus, internal validity was of particular importance in this study, given the study’s objective to examine relationships between internationalization and the various elements of the firm’s resource base components. To address internal validity, the investigator relied on two analytical techniques, as suggested by Yin (2003). Pattern matching was first completed and involved comparing an empirically-based pattern (i.e., the case study evidence) with a predicted one (i.e., the theoretical relationships outlined in the literature review). This analytical technique was supplemented with the use of explanation building during the cross-case analysis. The three propositions were tested and refined in first case and then tested and refined in the second, third, and fourth cases in an iterative way.

3.6.3 External validity

External validity was addressed by adopting replication logic (Yin, 2009). The theoretical propositions were tested in each individual case. With the use of multiple cases, replication logic allowed for similar results to be predicted in literal replications and different results for predictable reasons in the theoretical replication. Replication logic was achieved with the study’s sampling strategy by choosing to investigate firms of medium size with different pathways of expanding outwards.
3.6.4 Reliability

Reliability was addressed by assuring that the research can be repeated with similar results (Yin, 2003). This was achieved at the data collection stage by creating and using a well-organized case study protocol and a case study database.

3.7 Chapter Summary

This chapter described the case study method of research and explained its appropriateness for this research, defined the cases, provided a description of the interview protocol, the within case and cross-case analysis process and the tactics to ensure quality in case study research design. Chapter 4 will present the within case and cross-case analysis and results.
<table>
<thead>
<tr>
<th>Tests</th>
<th>Description</th>
<th>Case Study Tactic</th>
<th>Research Phase</th>
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<tbody>
<tr>
<td><strong>Construct validity</strong></td>
<td>Establishing the correct measures for the phenomenon under study.</td>
<td>Use of multiple sources of evidence in building cases (i.e., semi-structure interviews, archival records, websites, publicly communicated information, physical artifacts).</td>
<td>Data collection</td>
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<tr>
<td></td>
<td></td>
<td>Participants reviewed the timelines and interview transcripts to verify the accuracy of the data.</td>
<td>Data collection</td>
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<td></td>
<td></td>
<td>Refinement of case study protocol after first interviews to correct the wording and flow of questions.</td>
<td>Research design</td>
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<td><strong>Internal validity</strong></td>
<td>Establishing whether causal inferences can be made whereby certain conditions are said to lead to other conditions.</td>
<td>Conducted pattern-matching to determine literal and theoretical replications across cases.</td>
<td>Data analysis</td>
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<td></td>
<td></td>
<td>Addressed alternative explanations by examining if ‘rival theory’ (i.e., other internationalization pathways) provided rival explanation.</td>
<td>Data analysis</td>
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<td><strong>External validity</strong></td>
<td>Establishing whether the results can be generalized beyond the immediate cases.</td>
<td>Used replication logic in multiple-case studies and followed iterative process of explanation building.</td>
<td>Research design</td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
<td>Demonstrating that the operations of the study can be repeated with the same results.</td>
<td>Used a case study protocol for consistency between case studies, continuously focused on the firm and the components of its resource base.</td>
<td>Data collection</td>
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<td></td>
<td></td>
<td>Use of a case study database to store and manage notes, transcripts, digital recordings, memos, and other primary and secondary documents.</td>
<td>Data collection</td>
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Source: Adapted from Yin (2003, p. 34).
CHAPTER FOUR

CROSS-CASE ANALYSIS AND RESULTS

4.1 Introduction

This chapter presents the results from the individual case and cross-case analysis. The study’s findings are based on a series of in-depth semi-structured interviews with the senior managers of a limited number of companies. The objective of this study is not to determine the causality of the relationships between managerial cognition, learning and changes to the firm’s various resource base components. Rather, the purpose of this study is to further explore these relationships, which continue to gain theoretical interest yet remain empirically ignored, and to present certain observations that reiterate the importance of the need to better understand the impact of managerial cognition on the firm’s resource base renewal.

4.2 Single Case Analyses

The analysis chapter begins by providing descriptive accounts of the five design firms studied. The completion of the within-case analyses was guided by the study’s research questions. Furthermore, evidence from each case was compared to the theoretical frameworks described in Chapter 2. The objective of these within-case analyses is to provide a contextual understanding of the relationships
between the resource base’s components and managerial cognition within each individual case.

4.2.1 Company A

4.2.1.1 Description of company

Company A was founded in 1987 by the Managing Partner’s father. It is the oldest company in the sample. The company has evolved significantly since its beginnings as a family-owned company into a regional design consulting firm with a staff strength of 50 and project values of SGD60m in 2011. It has experienced growth rates of more than 20% in the preceding five years. At the time of its participation in the study, the company provided various consulting services: architecture services, interior and graphic design for which the company holds some patents. In many instances, the company uses at least two, if not all, of their service offerings to meet their clients’ needs.

The Managing Partner led a senior management team of five and makes all key managerial decisions in the company. The company draws from a list of external consultants and experts on whom it calls whenever it requires a specific expertise on a project-by-project basis. These individuals have their own careers and either work for themselves or for other companies, and are hired as sub-consultants to the company as and when they are available to do so.
“The company is quite well-known in the local market. The larger clients retain us, when they need specialty expertise. We’re a team of specialists, really.” [Managing Partner, Case A]

“It’s on a contract-basis and when the contract is over we part ways till we’ve got something new in the pipeline and I’ll give you a call.” [Design Partner, Case A]

Company A started out as a family-owned business. The managing director joined the firm at age 28 after returning from the UK with an interior and graphic design degree. His knowledge and expertise was learned from his father, both implicitly through experiential knowledge, and with internal objective knowledge. He also supplements his technical knowledge with continual management knowledge by completing graduate studies in business administration.

“I found out after leaving the reputable design firm Arup in London that to get into this business I would have to brush up on all the different aspects of the industry and get the proprietary notes from my father. We were doing like hotels, clubhouses and housing, that’s all architecture.” [Managing Partner, Company A]

In terms of promoting the company’s services, the managing partner registered his company with online databases and Singapore business promotion boards (e.g. International Enterprise Singapore (IE) and Economic Development Board (EDB) in foreign markets, piggy-backing on Singapore reputation at delivering projects that embody a blend of western and eastern
techniques. He is also a member of national and international design associations which serve as a means to tap into their networks. He characterized the markets as a “niche market.” His expertise in that area and the limited number of designers with such in-depth, specialist knowledge are the reasons for many of his international projects. The nature of this business line is international at its core and the networks play an important role in winning new clients and providing access to experts and their necessary technical knowledge.

“That networking is essential to the success of our business in the design field. I dealt with Hirsch Bedner, and of course they’re all over the world, so I have assignments in China, assignments in India, as a result of knowing them. Of course then you meet other people when you’re on those and you know, the networking just kind of spreads.” [Managing Partner, Company A]

4.2.1.2 Description of firm expansion and knowledge accrual from operating environment

The company expanded into the China market in 2002. The Managing Partner has extensive past experience working in foreign markets and exported many of the company’s designs abroad. He had developed a keen passion for travel to foreign countries and wanted to incorporate this passion into his work early in his career.
“I love to travel and do business everywhere. I just love it. When I was 17 years old, I travelled to Europe for the first time for 6 months, and that just got me going.” [Managing Partner, Company A]

Foreign projects account for approximately 50% of the company’s revenues. The managing partner estimated that 40% of the company’s foreign projects came from those on which the firm had bid and the other 60% came to them unsolicited. Clients often contact the company without their having to reach out and market their services, most likely due to word of mouth, network contacts and the firm’s reputation. They use the appropriate experts and technical knowledge from their network to complete projects, which often requires them to travel to the project sites. They also use their proprietary knowledge as a means to generate revenues. They licensed the designs for hospitality and F&B projects, which have been built using their specialized knowledge in various countries.

The managing partner considered his relationships with clients to be crucial to continually being able to securing work for their firm. He distinguished the company from rivals through a relationship-based and “pick the-winners” approach to generating business. Specifically, he had pride in the fact that the company a history of listening to its clients, working with its customers on unique designs, and developing relationships with its clients that permeated different levels of the organizations.
“The core of what we do is change the thinking of a lot of clients as to what we can do for them. Because of that we have actually broken a lot of standard perceptions of what a design firm is. We have gone in and asked questions and probed and really found solutions for people. We have learned to do this very, very well. We offer a basket of services and not just a product and we actually involve the client in generating their own solutions.” [Managing Partner, Company A]

4.2.1.3 Evidence of change triggered by uncertain external environment

The company planned a strategy and defined objectives annually. In 2002, in response to the dismantling of the regional trade services barrier, the managing partner revised the company’s strategy to incorporate changes in the nature of the services he wanted to offer. He sought to consolidate on the reputation that the company had built over the years by choosing to no longer provide detailed design work and instead concentrated efforts on providing specific expertise in the hospitality industry. The firm’s dynamic capability of strategic decision making realigned its services to reflect a planned change in the company’s strategy and ultimately innovated the firm’s service offering.

“The sort of design work we were doing was right down to the nuts and bolts and nitty-gritty; we don’t really want to do that anymore, that’s too pedantic. What we’re leveraging on now is our specialty skills and we are capitalizing on it to make the most out of it.” [Managing Partner, Company A]
Recognizing a trend in the industry in 2003 and through the push by the Singapore government to codify and institutionalize company processes and procedures, the managing partner perceived that it would give the company a leg up by investing early decided in ISO 9001 processes, which required the company to modify its documentation processes. After the certification won the firm several government project bids, the managing partner decided to maintain it.

“To enhance that, there’s a change in marketing that came about when suddenly in the 2000s, ISO 9000 was the big buzz word. So I decided we were going to get into that and we did. After that we had the chance to bid for a project in China with the largest hotel client. They came to our place and the fact that we had ISO 9000 won us the project.” [Managing Partner, Company A]

The managing partner also took to codifying tacit technical knowledge on which the firm’s competitive advantage was based. This knowledge codification may partly explain how the firm was able to license its know-how as a secondary means of entering foreign markets, considering its size and resources.

“Everything is an experience, and maybe the best example is when I started up my first hotel project I said to myself that if we build this one again, this is what we should do differently”. [Managing Partner, Company A]

The Managing Partner has also developed a particular dynamic capability, most likely from his past work experience, to ‘keep his ear to the ground,’ namely,
tracking the activity in the market and monitoring his percentage of winning bids. In doing so, he has demonstrated an understanding of the external environment and is able to adjust his pricing based on his winning statistics. This dynamic capacity for flexible change has had an impact on the firm’s operational capability to price and sell its services.

“I track our hit rate to see what the economic trends are— we normally win 1 out of 5 pitches. When I start getting 1 in 2, I check our prices: we’ve got to be under-pricing. So then we raise the price so we get it back to the right level. And if we’re losing, then either one of two things is happening: the economy is down, or we’re overpriced. So I adjust the price down, go back at the phone; pick up some of the business.” [Managing Partner, Company A]

The Managing Partner has also implemented continuous performance evaluation processes. By recognizing lost sales, completing client assessments and rectifying the firm’s strategy, the entrepreneur has continued to monitor the firm’s performance and quickly make the necessary amendments.

“That’s how I measure what’s going on; how successful are we doing based upon how many orders are we getting and are we losing – and why are we losing. If we lose an order, I’m very on top of why we lose so I can correct the strategy.” [Managing Partner, Company A]
The managing partner explained that performance evaluation has had significant positive outcomes for the firm. Over the years, the company has made important process innovations and adopted new technologies to gain efficiency in its production processes and continue to be competitive in foreign markets. This has had a direct impact of the firm’s service product and delivery processes.

“As far as the business side of things go, expenses are down. We don’t print drawings anymore. Blueprint machines— it’s all done electronically now so there’s no cost. Technology has made the ability to do our work more efficient. I can design a hotel – where it used to take me 40 hours by hand, I can now do the whole thing in under 8 hours.” [Managing Partner, Company A]

Although the company made several investments in costly dynamic capabilities, such as performance evaluation, it also reacted to unforeseen events in its external environment and as it learned that its operational processes were functional without requiring continuous change.

The company made specific investments to patent its designs, which were complementary technical assets to the design services they offered. The managing partner identified advances in consumer design needs that allowed the company to develop new designs, in the late-1990s when the housing market boomed due to rising middle incomes. The firm made opportunistic investments in R&D and product development, which were then supplemented with appropriate
sales and marketing processes to launch the newly developed designs in international markets.

The company made significant investments in sales and marketing in its early stages of growth. It promoted its services and technology to all its clients. Furthermore, the Managing Partner quickly developed a website on which he made available technical documentation for the firm’s services and products. Over time the company continued to receive unsolicited orders from international clients, which may explain why the entrepreneur has made no other investments in the firm’s marketing.

Not all of the company’s foreign projects were unsolicited. The firm did make some decisions to target foreign markets; however, this decision making process showed signs of being opportunistic, largely based on the firm’s network contacts and the success (or lack thereof) it found in these markets. On several occasions, the entrepreneur provided evidence of the company’s use of its network ties as a means to win new projects.

“The major country that I’ve gone after is China. In the late 1990s we had gone to Shanghai, I had a Chinese partner who was able to give us support. So we did promotions in English and Chinese and so forth, and nothing came of it. I became discouraged by that; I had heard it takes five years to break in the Chinese market, but then this project in Guangzhou came up, we had our break” [Managing Partner, Company A]
“That networking is essential to the success of our business in the design field. I dealt with Capitaland, and of course they’re all over the world, so I have assignments in Shanghai, assignments in Beijing, as a result of knowing them. Of course then you meet other people when you’re on those and you know, the networking just kind of spreads.” [Managing Partner, Company A]

4.2.1.4 Evidence of changes in cognition and capabilities

The managing partner’s managerial cognition had strongly influenced the company’s initiatives and direction. In particular, he did not believe in growing the firm simply for the sake of being big; he remained constantly mindful of the size of the firm and its ability to offer flexibility and scalability in response to opportunities and threats. Senior managers also agreed that the firm’s core business depended on their own cognition and knowledge. Thus, they assert that undertaking unique projects and engaging with their networks enabled them to deepen and extend their knowledge base.

The managerial cognition of the managing partner has led the firm to develop distinct capabilities in routinely delivering innovative designs by exploiting innovations in other areas, such as CAD systems and communication. The managing partner also claimed that the firm had developed skills in areas of design that his competitors lacked. His deep internal knowledge base in high end, interior designs, integrated with the firm’s procurement skills, enables the firm to offer high-quality but cost competitive integrated designs.
The firm also facilitates resource sharing across the design teams, which enables it to respond to changes in demand that arise from urgent requests from clients, variations in work priorities or unexpected volatility in the external market or internal resources. The firm culture promotes the idea of providing value to clients through high-quality work and pushing boundaries. These cultural values help the firm in both its environments. Its key strength lies in its aggressive management of its employees and supply chain members, requiring them to deliver quality and performance:

“We’re quite hard on ourselves from the point of view of performance and quality. We don’t really pretend to put up a nice, nurturing approach with our subcontractors. Most of our long-term suppliers obviously found [the need to] have this lifetime value approach to their client.” (Managing Partner, Company A)

The firm’s process for managing relationships is context specific and targeted (i.e. opportunity based). Managers foster constructive relationships among employees within the firm. It also contextualizes their practices to acknowledge local work cultures and practices.

The Managing Partner considered the company’s relationships with clients to be of paramount importance. He chose to distinguish the company from competitors by using a relationship-based approach to developing the business. He dictated
how organizational structures were created which, in turn allowed dynamic capabilities to either flourish or flounder in order to support innovative initiatives.

“I have always maintained our culture for team work, technology, sharing and transfer, bringing in knowledge and technology from outside and developing them to suit our needs. … So it's sort of a passion for business building. You know, it comes from that build a project, split it off, you know, grow it as a business kind of mind set that's occurred over the years. So the foundation of this approach is” — [Managing Partner, Company A]

However, there were instances where some managers, due to their varying cognition, past performance and experience, had felt constrained to voice out their disagreements due to perceived career conflict.

“You do have to provide protection and it is true that I do that overtly. But from a business side, they really think it is truly career limiting.”— [Managing Partner, Company A]

Nevertheless, given some of these concerns, managers demonstrated capabilities to sense and pursue opportunities. The managing partner explains how he attempts to change the cognition of his team’s towards new opportunities.

“We try to make the team see opportunities that we wouldn't otherwise see because of the mindsets we have, because of the mental models that we're
constrained by. In my mind, it has a lot to do with helping to manage mind sets, helping to manage paradigms, if you will, or break paradigms, helping to manage meaning in some sense. And at the same time then, what you’re trying to do is drive results…” – [Managing Partner, Company A]

In 2002, the company faced an uncertain future as a result of the Free Trade Agreement (FTA) coming into effect. Additionally, information communication technological advancements (ICT) had affected the firm’s products and production processes, i.e. for design and delivery. Although the firm’s products have not changed in nature, significant external and internal developments had altered them, including a shift in the design philosophy from designing for the mass market segments to designing for a growing, affluent class. A modern, design-conscious firms like Company A had to cater to changing client taste profiles by offering minimalist, steel-and-glass buildings. The firm was approached by major Singaporean developers including CDL, Far East Organization and Capitaland to provide designs that were more suited to young professionals.

“All these new generation of executives, they studied and work abroad; they get exposed to the modernism in Europe and America. Then they come back and they want to have this new look, modern steel and glass. Which is good for us, of course.” [Design Director, Company A]

The growth in dual income couples with no kids (DINK) had also led to an increased demand for convenient studio-type apartments, such as lofts and small
office-home office (SOHO). This has caused Company A to expand its business in this area by shifting its design focus to boutique housing. Developments in CAD technology have also allowed for myriad innovative design techniques. Structural adjustments in the Singapore design sector, due to changes in the markets, had also introduced new layers of complexity and uncertainty into resource procurement. Additionally, the company faced changing processes in its markets related to financial (e.g. currency locations, banking regulations, tax processes), legal (e.g. contract forms, payment terms, industrial relations) and cross-cultural (e.g. employees’ cultural backgrounds, interpretation of client requirements) specifications. Thus, the external environment, in which clients demanded unique designs, constantly challenged the adequacy of the firm’s existing capabilities.

The firm reassembled capabilities to align parts of the firms, reshaped organizational processes, and apply the knowledge base toward the changing market needs. The managing partner explains the importance of reassembling the capability to reshape the firm.

“I think that is the biggest challenge we face is to deal with changing markets, to figure out how to reshape the firm, to redirect people into areas maybe they are less familiar with, but where they can still be successful.” – [Managing Partner, Company A]

The managing partner had been concerned with the firm’s performance which had been declining rapidly at the onset of the Free Trade Agreement. This led to a
realization that the firm needed to develop new services if it were to survive. Hence, the managing partner embarked on continuous investment in technological capacity both through training initiatives, capital investment and in the development of technology based solutions for clients.

The managing partner’s use of his personal network of contacts may explain how the firm identifies and assimilates new information. There was a change in the resource base of the firm over time and the managing partner had changing strategic priorities. His managerial perceptions were central to developments of the firm. Activities included a focus on business development through investments in staff, technology and at times deliberate investments to build new skills or capabilities within the firm. He also committed financial resources to the development of marketing activities to diversify its markets. He recruited staff with technical expertise new to the firm, which allowed the firm to develop new services for client even when other managers were not in favor of the decision. Originally, the managing partner had no preconceived client segments in mind as he approached different developers to discover their specific needs. At that time, the SOHO homes were gaining in popularity and the managing partner and his partner were convinced that this provided opportunities for the company to be active in this area:

“We were totally convinced in the emerging demand for SOHO due to increasing affluence of DINKS (Double Income, No Kids). And we wanted to develop new designs to cater to this change.” [Managing Partner, Company A]
As other firms were also beginning to show interested in this segment of the market, Company A’s managerial team quickly ramped up efforts to try to capture a larger slice of this market in Singapore.

4.2.1.5 Capability assembly process- cognition of capability purpose and capability salience

The managing partner began to focus intensely on clients’ needs in order to identify the potential product areas to build on. The client needs led the firm to acquire operational capabilities in managing client relationships and license external skills as part of its offering. Designs were gradually standardized, packaged, and branded. Branding was associated with an increasingly clear vision for the firm. This vision formed the basis for the capability assembly. The expanding marketing team made it possible to partner with other firms. Growth opportunities in the emerging markets of China made it compelling for the company to expand overseas in 2004.

Company A’s capability assembly process reflected its cognitive emphasis on its capabilities had shifted to respond to the falling trade barriers. For example, expanding the initial partnership from three partners to five and then growing it to include six more senior associates required more sophisticated human resources capabilities. External resource integration, partnerships, and acquisitions similarly required increasingly advanced capabilities. Interacting with clients to find out their needs and developing relationships and service concept partnerships also required more sophisticated external market interfacing capabilities. Additionally,
evolving from narrow focused approach to a vision of a more complete offering
represented advancements in managerial capabilities to conceptualize and understand the design business.

The case study data suggest that Company A’s cognitive process led to changed outcomes, such as an ability to identify the changing needs of the client base, fluctuating local/international market conditions or the shifting environmental landscape. In particular, the firm performed its sensing process using conscious routines to scan emerging sectors or peripheral niche markets that might value the firm’s capabilities (e.g. rapidography).

“We stay away from development projects in lower-tiered cities in China that would take too long to achieve fruition due to the complicated ownership structure there. We target a certain niche … primarily government projects because of the level of quality and expertise required. … Therefore we have addressed the threats from low-end low margin competition. [Managing Partner, Company A]

These cognitive routines enabled the firm to explore new technologies that might impact the business. Managers explored opportunities with their supply chain partners through organizational routines, such as exploring how new technologies offered by supply chain partners (e.g. facade suppliers and manufacturers) might lead to new business opportunities. Senior managers travel intensively to identify value-creating suppliers with which they can build relationships to create new opportunities:
“What’s the lifetime value of a repeat client that hires us for new projects on a regular basis? That becomes the value of the goodwill for us … We add value to our suppliers and clients and our suppliers relate to us through this approach”.

[Managing Partner, Company A]

The ability to secure business through client recommendations reflects the firm’s capability to apply cognitive routines to sense and respond to changing client needs in different niche markets. For example, its sensing process enabled the firm to identify a new (peripheral) market opportunity for boutique housing needs in the Tier 1 cities of China. According to the managing partner, not many design firms had detected the significance of this market need early, which was driven largely by the quickly growing affluence of the Chinese middle class. But through sensing processes driven by cognitive routines, the Company A perceived this opportunity.

The capability helped Company A to establish long-term relationships with clients at different levels of the organizations, including at a senior management level, technical level and at the most junior level. These relationships have helped the firm to attain considerable understanding of their clients’ needs and expectations.
Table 4A-1: Company A- Summary of learning and change in response to operating environment

<table>
<thead>
<tr>
<th>Change triggered by external environment</th>
<th>Evidence from company of managerial choice and action</th>
<th>Demonstrated changes to operational capabilities, routines and resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification of dynamic capabilities</td>
<td>Service innovation</td>
<td>Changes to service offering: no longer provides detailed design work but rather produces the general blueprints requiring specialized expert knowledge</td>
</tr>
<tr>
<td></td>
<td>Adherence to guidelines for certification</td>
<td>Changes to documentation procedures in service production and delivery processes</td>
</tr>
<tr>
<td></td>
<td>Development of a licensing to expand overseas</td>
<td>Increase in financial resources Necessitates partner relationships to maintain the licensing model</td>
</tr>
<tr>
<td></td>
<td>Tracking and recording project bid wins</td>
<td>Changes to the services pricing</td>
</tr>
<tr>
<td></td>
<td>Performance evaluation</td>
<td>Investments in new technological resources to gain efficiency</td>
</tr>
<tr>
<td></td>
<td>Cognition of opportunity in the market as a result of technological advancements to opportunistically develop and market new products</td>
<td>Changes to the firm’s service production as products become supplementary to its design services Changes to sales and marketing processes to launch in the China</td>
</tr>
<tr>
<td></td>
<td>Marketing of company in global databases</td>
<td>Impact on the service delivery depending on the country in which service is solicited</td>
</tr>
<tr>
<td></td>
<td>Development and launch of the firm’s website</td>
<td>Change to the marketing and sales process; impacts service delivery</td>
</tr>
<tr>
<td></td>
<td>Choice of markets for solicited projects is opportunistic and largely based on network ties</td>
<td>Impact on service production and delivery and resource allocation processes</td>
</tr>
</tbody>
</table>
Table 4A-2: Company A- Cognitive processes in assembly of capabilities

<table>
<thead>
<tr>
<th>Managerial cognition</th>
<th>Managerial choices and actions taken to assemble capabilities</th>
<th>Evidence of dynamic capability assembled</th>
</tr>
</thead>
</table>
| Cognition of capability purpose  
  - Identify purpose for which capabilities would be assembled  
  1. Problem cognition - Managers perceive organization shortcoming or gap in performance relative to strategic goals  
  - Managerial learning about nature of the problem  
  2. Cognition of impact on firm capabilities | Financial crisis and deregulation caused management team to be concerned about falling revenues. Cognitive shift to be more client-focused and need to assemble necessary routines  
  - Managerial concern with “being spread too thin”  
  - Managerial cognition that maintaining relationships with clients are crucial to secure more work | Client relationship capability  
  - Client-driven focus  
  - Long-term relationships with clients at all levels  
  - Constantly engage with clients on projects and address client needs  
  Design innovation capability  
  Developed new service offerings requiring specialized expert knowledge  
  - Focus on generating new solutions to suit client needs  
  - Build specialized technical team to support this capability |
| Cognition of capability salience  
  - Understanding what the firm can do  
  1. Managerial knowledge of what the firm can do from previous experience in executing routines  
  2. How managers compare strengths of firm with the competition | Capability to leverage cultural diversity of team, deploy employees with empathy to values of target markets for international projects  
  - Strong client-driven culture – history of listening to clients  
  - Strength in networking and furthering relationships with key clients |
4.2.2 Company B

4.2.2.1 Description of the company

Company B was founded in 1990 and had annual project value of approximately S$85 million in 2011. It is the second oldest company in the sample with 65 employees. The firm started out with residential designs in 1990. It later diversified into commercial and retail design projects. Company B aspires to achieve $150 million in annual project values by 2015. It competes by arduously targeting specific clients and business partners to develop long-term business with, and then forges intensely close, special personal relationships with them. This is done at all levels of the firm.

Company B churns out a wide variety of cutting-edge designs for commercial clients in Singapore and Tier One cities including Beijing, Shanghai and Guangzhou in China. These include high-end boutique hotels, Class A offices, posh condominiums and luxurious gated villa communities. It was also the lead behind an alliance of firms formed to penetrate the China residential design market beginning 2003.

The Managing Director had been with the company since its founding in 1990 and took over helm to run the company in 1998 at the height of the Asian Financial Crisis. He is heavily involved in all key decision-making in the company and is supported by 6 senior managers, each heading different functional areas of the company. Over the years, he has built strong network ties with the company’s
main clients who provided them with a constant stream of projects in Singapore and China. His knowledge and expertise was built over the years, both implicitly through experiential knowledge, and with internal objective (codified) knowledge. He also developed managerial knowledge by attending a spate of refresher courses and industry seminars over the years. His marketing capabilities and network of contacts has played an important role in the company securing new clients and providing access to experts and their necessary technical knowledge over the years.

“There is no doubt that in this business, networking is absolutely necessary. My son is based on Boston and is the guardian of the two sons of my biggest client. They just got into University. My wife takes care of his (client’s) wife whenever she visits her sons in the U.S.” [Managing Director, Company B]

The quote above indicates the extent to which the Managing Director went through to build relationships and bond with important clients.

4.2.2.2 Description of firm expansion and knowledge accrual from operating environment

Company B’s strategy is largely guided by it’s the managerial cognition of its managing director. The firm’s specific goals reflect his desire to compete in the marketplace. He constantly pushed his stated aim to pursue larger growth opportunities in foreign markets, rather than to stay within the local niches in Singapore. The firm’s competitive approach reflects the managing partner's
cognition to carefully target partners and clients and work with clients at all levels of the organization. The company conducts a comprehensive assessment every June, and engages in activities to ensure that it is well positioned to meet its strategic goals. The managing partner holds a comprehensive strategic planning session in June of each year. Key managers and other senior staff are brought to a location away from the office and reinvolved in a review and rewrite of the firm’s strategy. Following this continuous exercise year after year, the firm developed a comprehensive description of its strategy which is disseminated throughout the firm. The firm was recognized as one of the top ten best managed architectural firms in Singapore by Building and Construction Interchange Asia 2004.

Company B also engages in other regular activities to accrue market knowledge including the monitoring of developments in the external environment on an ongoing basis by investing in market data, paying attention to industry trends, attending trade shows, conducting office checks, examining new designs, sharing articles from magazines and trade journals among key staff, networking in the industry.

In pursuing growth alternatives in China, the managing director sought to ensure that his own organization culture was a good fit with other partners who had similar ambitions. He recognized this partnering as a form of flexible specialization since firms have traditionally partnered to augment and complement services they either did not provide or in which they were relatively weak. This partnering allows the individual firms to focus on their core capabilities, enabling
each other to advance their strategic objectives. Hence, its collaboration with the other firms would permit multiple opportunities to extend services, customize offerings, enter new markets, staff up or down in a “virtual manner”, and remain adaptable. Firm B also reviewed the depth of its own financial resources before deciding that its growth objective would best be served by acquiring some other firms, rather than the slow process of organic growth.

Company B was able to penetrate emerging markets as its design repertoire and reputation grew, leading to an increasing project pipeline and bringing the firm closer to achieving its growth objectives. It developed a reputation with client based on the way it managed relationships with them and delivered quality designs.

4.2.2.3 Evidence of change triggered by uncertain external environment

In the early 2000s, faced with an uncertainty as a consequence of the Singapore government’s plan to implement the Free Trade Agreements (FTAs) and the considerable pessimism about the viability of the local industry once the agreement came into effect, Company B acted quickly by divesting all its non-core businesses in 3D computer animation services, landscaping and interior decoration contract work to focus on design consulting services for high-end condominiums and hotels, which ultimately kick started rapid growth for the firm in a focused segment of the industry.
The Managing Director of Company B quickly saw the opportunity to enter the China market by developing Western-styled, differentiated, modern and sleek designs that were beginning to appeal to Chinese clients and were in very short supply then. It understood that the quality of designs sold by Singaporean firms was considered better and more up-to-date than those produced by their counterparts in China. It also recognized the fact that hotel designs in Singapore were getting more sophisticated than others in the region, on account of Singapore's earlier move to embrace global hotel standards and international chains from the US and Europe. Moreover, Singapore's management systems were considered more readily transferable to the Chinese markets since it was a blend of both eastern and western techniques. It was then determined that the least risky strategy to internationalize was to partner other aspiring firms with complementary capabilities and resources. It believed the Chinese would be more amenable to conducting business with Singaporean firms if they could commission a wider range of international, western-looking designs that were lacking in their own market. Company B, with its four partners, now provides a full-suite of design consulting services for both large private and state-owned Chinese companies on large scale, luxury condominiums and hotels in the Chinese first-tier cities of Beijing, Shanghai, Chongqing, Chengdu and Guangzhou.

In 2008, following the financial crisis, the company conducted a detailed evaluation of its internal environment and what the firm was best at. The managing director felt it was critical to develop capabilities in managing client relationships. It devised numerous strategies to achieve this including:
i. targeting and working with successful clients,

ii. seeking out highly talented designers and managers with strong marketing capabilities,

iii. acquiring human capital that fit into the organizational culture,

iv. forging intensely close relationships with clients at different levels of the firms,

v. paying particular attention to serving clients’ needs, being open with them, walking the talk, showing that they are passionate and committed in the marketplace.

These strategies are driven by the prior experience and managerial cognition of the managing director. The firm leverages the way it manages relationships with clients to gain access to new markets and create rent-generating opportunities. It understands that clients play an important role in helping it to develop the necessary marketing and technical knowledge, and that close personal relationships and human resource factors (e.g. project team and manager), experience, and project understanding, plus past experience with the client are important factors that would make the firm successful. It also believes that trust-based attributes and untraded dependencies play a significant role in the firm’s competitive advantage. Its relationship-based approach has resulted in clients coming back repeatedly with new projects on a consistent basis.

The managing director tried to leverage the company’s human resource by optimizing the level of communication across managers, taking advantage of their different styles, and ensuring that appropriate managers are in place. He had felt
that the growth in dual income couples with no kids (DINK) would lead to an increased demand for convenient studio-type apartments, such as lofts and small office-home office (SOHO). He compelled the management team to shift its design focus to boutique housing,

Managerial cognitions about the changing trade regulations caused the firm to change its product-market strategy by divesting the other businesses to concentrate on high-end condominiums since the Managing Director saw this as the best way to survive. Thus, the firm shifted its competitive premise towards carefully picking clients and penetrating them from a relationship point of view and made changes to its business system by hiring more professional managers. This suggests that product-market strategy seems to be quite readily influenced by changing environmental conditions.

When faced an uncertain future in the early 2000's as a result of the Free Trade Agreement (FTA) the managing partner was forced to reexamine the firm's strategies and determine how the firm was going to survive. Cognitively, the managing partner felt the firm had a strong survival chance and decided to soldier on despite the negativity within the industry about the viability of smaller firms once the trade agreements would come into effect. He instructed his managerial team to monitored trends in the U.S. and Europe markets since he felt that design firms in these continents are strong innovators and European design trends are good indicators of where the South-east Asian industry will be heading in future. Company B's objective was to be a $150M firm by 2015. To achieve this goal, it
focused primarily on expanding its product offerings in the China market (and in
doing so developed larger market niches). However, its managing director
indicated that it might be easier to grow through acquisition. He sought over time
to ensure that the company had a high caliber management team relative to other
firms of their size.

The Managing Director had a strong competitive desire for his family business
prosper. He explained that the firm’s design focus is in keeping with his family’s
original business. It started out with mass housing design in the 1970’s and later
expanded into hospitality designs in the 1980’s. He explains,

“We think of our firm as having always been in the lifestyle business whether we
are designing apartments, bungalows or hotels Whatever we do we have always
been in the lifestyle business.” [Managing Director, Company A]

Managerial cognition also influenced the managing director to pursue larger
market niches in China as he was not content to merely serve small market
niches, although the firm had considerable success in this area. The managing
partner was interested in business with a passion for clients. This is reflected in
the firm’s competitive premise, which is to carefully pick clients and then penetrate
them from a selling relationship point of view.

As the managing director felt that strong managers can be costly to acquire and
the firm may not be able to afford the addition of several high caliber managers at
the same time, he deliberately paced himself in terms of building his managerial
team. Each year he added a new “corporate refugee” with the recognition that the addition of high caliber staff is not something the firm can afford to do all at once.

The managing director tried hard established long-term relationships with their clients that permeate different levels of the organizations, including at a senior management level, technical level and at the most junior level. He felt that these relationships have helped these firms to gain considerable understanding of his clients’ needs and expectations. He identified managing client relationships as an area of strength and identified the company’s competitive premise to develop relationships with clients at various levels of the organization. The Managing Director made investments in tangible resources to support its operational capabilities by hired a human resource manager to build its managerial skills since he felt that this individual could leverage the strength of the management team. Marketing innovation is particularly important to the managing partner as he explained, “clients will just not be paying attention” if firms are not “innovative in terms of their designs, service and marketing approach.”

“The core of what we do is change the thinking of a lot of firm as to what we can do for them. Because of that we have actually broken a lot of standard perceptions of what a design firm is. We have gone in and asked questions and probed and really found solutions for people. We have learned to do this very, very well. We offer a basket of services and not just a product and we actually involve the client in generating their own solution.” [Managing Director, Company B]
The technical director explained the success of the firm’s marketing and sales approach is predicated on “paying attention to clients” and on being “open in these relationships.” He shared the following example to illustrate the effectiveness of this marketing and sales approach:

“We had a preliminary meeting with a client, who had never commissioned us, the other day. We understand they had a negative impression of us, yet they came in here and spent a half day with us. We toured around the office. We talked to them about our business and what we could do for them and showed them some ideas and so on. After the meeting, we learned they had opened up more to us on this first visit than to anybody else. Furthermore, we learned that others have taken up to three years to penetrate this account. So, the fact that our meeting resulted in the generation of three ideas, probably two of which will make it to reality, was something almost unheard of for this client.” [Technical Director, Company B]

4.2.2.4 Evidence of changes in cognition and capabilities

The managing director’s cognition changed when the financial crisis and deregulation occurred after it senses a problem that challenges its current stable operational state. An example is the firm’s decision to switch from acting as a Singapore-based operation to expand into international operations, thereby respond to the external threat caused by the dismantling of trade barriers by entering new markets. Additional opportunities offered by new information technologies or product development ideas undergo careful evaluations, prior to
their potential adoption. The managing partner purchased a 3D printer, which he thought would add value by enabling the firm to make prototypes for display to clients. However, a popular, high-end, software technology tool (i.e. building information modeling [BIM]) was rejected for its limited value to the core business:

“A lot of designers are using Revit, but the level of visualization and detailing in this particular software is limited”. [Technical Director, Company B]

The opportunities the firm seizes contribute to process improvements, such as innovations in the hospitality and transportation sectors. It combines conscious cognitive routines with functional organizational routines to select appropriate clients to conduct long term business with, which has the capacity to develop loyalty and commitment. Lessons learned from dealing with difficult clients in the past have become embedded in managers’ tacit knowledge base, informing the organizational routines of the firm, to avoid such clients in the future. This tacit knowledge base informs the firm’s decisions, which suggests path dependency in its decisions about new technology adoption and new market penetration.

The service provided to long-term, valuable clients reflects organizational routines, which have enabled the firm to build and maintain its reputation and create the potential for repeat business and referrals. However, any changes to existing client or supplier relationships are sensed and addressed in a timely manner. That is, managerial cognitive routines are critical to develop an appropriate client and supplier network. The managing partner develops relationships based on the
firm's knowledge about the value of suppliers or clients. Specifically, the firm determines each supplier's or client's value to it, then engages with valuable ones by developing long-term partnerships, but adopts short-term, arm's-length approaches to others. When the firm senses competition among suppliers of non-critical supplies, it takes advantage of the situation to use price-driven procurement methods.

Managers are conscious of the need to recognize and seize opportunities that do not relate directly to economic outcomes, such as developing trust-based relationships and engaging with the community. The firm offers internships and scholarships for students; it engages with educational institutions in an advisory role. Through such activities, the firm consciously develops partnership routines that can introduce new exogenous resources. The seizing process for such non-economic factors thus reflects integrative routines.

Managers also believe they are able to deliver projects that their competitors are unable to do so. The MD specified the firm’s ability to mobilize its knowledge within the firm, collectively developed by designers, project managers and technical specialists and integrative (i.e. knowledge gathered from boundary resources, such as consultants and suppliers) routines to push the boundaries of its offerings. The firm’s organizational routines and resources grew gradually, through constant work on unique design systems, and its partnering approaches allowed it to exploit new external boundary resources (e.g. suppliers, technical consultants), to its advantage.
Exit routines describe explicitly how the firm abandons existing, inadequate resource combinations. For example, evaluating and dismissing consultants or suppliers that fail to perform up to expectations is an automatic cognitive routine at the company.

“Some of the consultants/suppliers are better than others and we’ve had bad ones and we’ve had reasonable ones. We definitely do not use those that have failed us before. It’s really based on performance.” [Managing Director, Company B]

Company B’s cognitive structure emphasize several aspects: (i) paying attention to new revenue structures, (ii) choosing target groups and building client commitment through constant engagement. However, the managing director realized that the firm had weak capabilities in developing internal decision-making processes and building internal commitment to the new services.

“We have tried to implement old services in a new way – so that clients will take the main responsibility for updating the information and there’ll be a lower workload for our staff.” [Managing Director, Company B]

4.2.2.5 Capability assembly process- cognition of capability purpose and capability salience

Company A practices learning-by-doing which enables its business to grow. In recent years, there had been a strong focus on securing revenue streams, which
lowered the tolerance towards experimenting. "Make mistakes, but make them quickly and learn from them" was the mantra. Since the beginning of 2007, the responsibility for the development of new designs, including financial responsibility, was entrusted with a new Design Director to ease the burden of the Managing Director, who had previously had to cover extended duties. It became a cooperative process between the teams, which resulted in more synergies across and within different functional areas.

“We have meetings quite often and I have telephone and mail contact with the Design Director every week. I sit with the design team one day a week to “breathe in” that business as well … I think we have a really good dialogue among us.’
Managing Director, Company B

The firm has realigned its tangible and intangible resources to sustain and improve its operations. Its key internal resources are its employees and its knowledge base (both codified and tacit); external (boundary) resources include consultants and suppliers. The firm deploys organizational routines to re-bundle these resources, with a view to reducing the extent of outsourcing:

“We’re good at shuffling things around and trying to come up with a better way, a better price to do it, because everybody else just puts their mark-ups on it. “
Managing Director, Company B.
For example, the firm has developed the capability to design modular housing systems by re-bundling its operational capabilities for static systems with boundary resources. The firm also reconfigured its existing capabilities to take advantage of opportunities to expand its business internationally. The firm re-bundled resources associated with building systems to seize the opportunity for bespoke condominiums in Singapore and China. In reconfiguring boundary resources, the firm was able to take advantage of its suppliers' quality standard certifications. To address the complicated nature of conducting business in China, it relied on a consultant with whom it previously had developed a relationship.

Its most recent initiative sought to introduce an innovation that it tested successfully in Singapore into the China market. Specifically, the firm observed that the inadequate experience with onsite fabrication among drafting suppliers led to poorly detailed drawings. To address this issue, the firm placed a skilled draftsperson on site for an extended period, to allow the supplier to learn about fast-tracked fabrication processes. The knowledge the draftsperson gained by observing onsite fabrication enhanced the detail of the resulting drawings and improved operations. This highlights the firm's capability to share skills and replicate resource generation in various locations and situations.

By integrating its key resources with site-specific client requirements, the firm is able to provide design systems within cost estimates. The managing director's technical experience (functional routines), integrated with the skills of consultants and suppliers (integrative routines), and the subsequent deployment of
procurement approaches enabled the firm to arrive at practical alternative designs with appropriate pricing and support design-cost evaluations. Few competitors are able to price their designs with similar accuracy. Most competitors would normally wait for manufacturers and suppliers to clarify whether an element can be produced and at a particular cost.

Learning accumulated through the capability assembly processes is captured in organizational routines, to deepen the firm’s knowledge base. However, this routine remains tacit and resides in the minds of the managing partner and senior managers, which they regard as a form of intellectual property rights protection:

“The realm of patent provides protection but is very costly. What we do requires ingenuity and intellectual property that really resides in the minds.” [Managing Partner, Company B]

The firm’s design process reduced the need for highly skilled labor during site fabrication. Thus it can compete more effectively on quality and price in less developed nations, where access to highly skilled labor often is limited. The reallocation of drafting duties between the Singapore and Vietnam offices, using simple processes, illustrates the firm’s capacity to reconfigure its resources as necessary:

“We’ll draw in Singapore and send it to Vietnam for them to] draw overnight and then we’ll have it back in the morning … If you work it properly, you could have a 24-hour drafting cycle.” [Managing Partner, Company B]
Company B reorganized its design activities in 2006 to form a centralized unit housing all people working within the hospitality segment. Apart from taking the pressure to do as well both locally and internationally, the new unit produced an increase in knowledge-transfer and synergy effects. Meetings took place on a frequent and regular basis across functions (e.g. sales and design teams), the main purpose being to coordinate the joint activities and to learn from each other. Earlier, the Design Director had described international development as being “step-motherly” due to time or knowledge limitations. With a few exceptions, all drafting activities were transferred to the Vietnam office.

“We liberated all the design teams from the financial yoke, but also reserved the right to do business with their brands.” [Technical Director, Company B]

While Company B has some new resources for its new services, its main organization and business is rather separate from them. Correspondingly, it shows only weak reconfiguration capabilities, with little organizational learning and adaptation.

“I really wish that the design industry had influenced the way we work here, and react, and the speed at which we did it…. but it really has not.” [Managing Director, Company B]
Company B has assembled dynamic capabilities to focus on developing the resource base of the firm through investment of funds in developing an IT-based management platform to offer project management services to customers. The initial focus was primarily on the core skills development of operational staff. This was reflective of the significant changes in technology in the design industry and the consequent requirement for up-skilling technicians. As the skills development issue became more incremental than radical, the focus of the managing partner shifted more towards operational efficiency and productivity which resulted in a re-location of the business from a number of sites into one modern facility. The global financial crisis precipitated a clear shift in the priorities of the managing partner towards the more strategic evaluation of the business to focus on leveraging the group’s capabilities on an international scale.

The evidence suggests that assembly of a dynamic capability emerged in the firm through: (i) learning (ii) identifying and accruing new knowledge (iii) the managing partner’s perceptions, and (iv) leveraging of managing partner’s network of contacts. The managing director invested in staff training and development and development of the technical solutions and other technological developments which he perceived as critical skills. He focused increasingly on the client. The firm assembled its capability over time either through recruitment and development of key staff or through the short term contracting of expert personnel. The firm also used third parties to boost performance in key ways. An underlying factor in these developments was the managing partner’s focus on firm performance prompted by the deteriorating sales He developed an extensive
knowledge of his firm, the design markets and his clients’ requirements. Knowledge became tacit as the level of expertise grows (Crossan, Lane and White 1999). The individual becomes much less aware or conscious of what it is or just how much they know. The literature review highlights that absorptive capacity is cumulative in nature (Cohen and Levinthal 1990, Zahra and George 2002, Easterby-Smith, et al. 2008). In particular, different levels of absorptive capacity between firms is likely to result in an increasing divergence in absorptive capacity between them as the firm with the higher level of capacity adds additional capacity at an increasingly divergent rate (Van Den Bosch, Volberda and De Boer 1999). The social capital literature recognizes both the actual and potential resources of an individual’s network and how they can be drawn upon by the individual (Bourdieu 1986, Nahapiet and Ghoshal 1998).

The case study data indicate how the firm’s resources changed over time. First, the firm assembled the capability to deal with the uncertain markets. It expanded into other Asian markets, using an export mode in 2004. Since 2006, its China operations have been performed by a sister company. This progression is indicative of capability assembly. The firm developed technical capabilities to design and develop unique designs over time by re-assembling its existing resources and routines. It also devised more flexible managerial and production processes. Thus the firm has not remained rigid but developed flexibility in adapting to changes in the external environment. It has produced a range of service innovations, including product and service, process (e.g. deployment of cutting-edge software to reduce design times), market-based (e.g. designing
products for specific markets, such as high-end clients; focusing on government clients in international markets), supplier-based (e.g. long-term relationships with key suppliers; ensuring quality, price and delivery standards), organizational (e.g. boundary-spanning roles such as an onsite draftsperson, shared routine duties between Singapore and China). That is, the firm’s dynamic capabilities feature innovation processes that have helped it produce modification to products, markets and processes.

Company B developed service innovations targeted at their new clients. All of its evaluated innovations were the first to adopt the chosen technologies in their markets. One of them was aimed at a completely new interiors market (a new niche segment not previously covered by any of the company). The services were targeted at a broader client base. This led to a renewal of their customer base after the launching of these services. It was also observed that relatively little incremental development took place following the launch of these service innovations, and it could be a couple of years before they would launch new innovations within each category.
Table 4B-1: Company B- Summary of learning and change in response to operating environment

<table>
<thead>
<tr>
<th>Change triggered by external factors</th>
<th>Evidence from company of managerial choice and action</th>
<th>Demonstrated changes to operational capabilities, routines and resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification of dynamic capabilities</td>
<td>Service innovation</td>
<td>Changes to service offering: no longer provides 3D computer animation services, landscaping and interior decoration work. Focused on value-added services high-end hospitality</td>
</tr>
<tr>
<td></td>
<td>Development of differentiated service model</td>
<td>Developed blended Western-style products with Eastern functionality and techniques</td>
</tr>
<tr>
<td></td>
<td>Tracking and managing client needs</td>
<td>Targeting and forging close relationships with successful clients and acquiring appropriate human resources</td>
</tr>
<tr>
<td></td>
<td>Firm performance evaluation</td>
<td>Investments in market intelligence</td>
</tr>
<tr>
<td></td>
<td>Recognition of opportunity in the market as a result of changing socio-economic needs and market new products</td>
<td>Changes to the firm’s service production as products become supplementary to high end hospitality design services Changes to sales and marketing processes to launch in the China</td>
</tr>
<tr>
<td></td>
<td>Recognition of technological advancements to support design process- e.g. rapid prototyping</td>
<td>Impact on the service delivery and changes in pace of product development cycles</td>
</tr>
<tr>
<td></td>
<td>Development and design of modular housing systems.</td>
<td>Changes to the operational process; impacts service delivery</td>
</tr>
<tr>
<td></td>
<td>Choice of markets for solicited projects is largely based on network ties</td>
<td>Impact on service production and delivery and resource allocation processes</td>
</tr>
</tbody>
</table>
Table 4B-2: Company E- Cognitive processes in assembly of capabilities

<table>
<thead>
<tr>
<th>Managerial cognition</th>
<th>Managerial choices and actions taken to assemble capabilities</th>
<th>Evidence of dynamic capability assembled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition of capability purpose</td>
<td>Pessimism about viability of local industry once FTAs came into effect. Cognition shifted to divest non-core businesses to focus on higher value-added consulting</td>
<td>Client relationship capability</td>
</tr>
<tr>
<td>- Identify purpose for which capabilities would be assembled</td>
<td>- Cognition that existing business activities were being too broad</td>
<td>i. hired highly talented designers and managers with strong marketing capabilities,</td>
</tr>
<tr>
<td>1. Problem cognition: Managers perceive organization shortcoming or gap in performance relative to strategic goals</td>
<td>- Cognition of opportunity to enter China market</td>
<td>ii. acquired human capital that fit into the organizational culture,</td>
</tr>
<tr>
<td>- Managerial learning about nature of the problem</td>
<td>- Need to assemble capability to develop Western-styled, modern designs for China market</td>
<td>iii. forged intensely close relationships with clients at different levels of the firms,</td>
</tr>
<tr>
<td>2. Cognition of impact on firm capabilities</td>
<td>- Skills needed to target high end clients and penetrate from relationship point-of-view</td>
<td>v. paid particular attention to serving clients' needs and being open with them</td>
</tr>
<tr>
<td>Cognition of capability salience</td>
<td>- Clients are important to access new markets and develop marketing and technical knowledge</td>
<td>vi. close and long-term relationships with key clients</td>
</tr>
<tr>
<td>- Understanding what the firm can do</td>
<td>Managerial cognition of Singapore's management systems as more readily transferable to China markets</td>
<td></td>
</tr>
<tr>
<td>1. Managerial knowledge of what the firm can do from previous experience in executing routines</td>
<td>Capability to adapt Western hotel standards to Chinese markets</td>
<td></td>
</tr>
<tr>
<td>2. How managers compare strengths of firm with the competition</td>
<td>- Perceived partnering as least risky strategy to penetrate Chinese markets.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ability to orchestrate activities with partnering firms</td>
<td></td>
</tr>
</tbody>
</table>
4.2.3 Company C

4.2.3.1 Description of the company

Company C was founded in 1999 and had project values of SGD70 million in 2011. It is the third oldest in the sample. At the time of study, it employed 55 staff with 20 technical and support employees responsible for the marketing, production, delivery and R&D of its design systems. Its core managerial team is highly experienced and most had some experience working with foreign players. The company has chosen to act as a local service integrator by partnering with leading design firms and working with contractors and suppliers on providing integrated design and build solutions. At the time of the interview, the company had experienced flat growth in its domestic market and so had therefore decided to focus on emerging foreign markets, particularly China.

The Managing Partner has been at the helm of the company since inception. Early in his career, he was frustrated by the missed opportunity to venture into innovative and flexible housing projects that his former employer had felt was too small a niche market to pursue and so he struck out on his own to build upon this particular market in 1999. As founder, he represents an important company asset; his managerial cognition is one of going forward with reason and little hesitation. He demonstrates drive and little seems to put him off. He is not one to put his firm’s future in the hands of others.
“If I operate from the assumption that I have a choice and someone else will succeed on my behalf if I don’t go succeed for myself, that’s true. But if you don’t push for it, then the question is ‘How do I ever achieve success?’ [Managing Partner, Company C]

The company has not always been a design integrator. Through trial and error, it has changed its revenue model multiple times over the years. The global financial crisis in 2008 had precipitated a change in the founder’s managerial cognition from a niche player to become an integrator to sell a total solution. The managing partner concluded that the only way to make the most out of each deal was to integrate and sell the final outcome, which significantly increased the complexity of the firm’s production and delivery processes.

“These days for us the only way to make money is to provide integrated design services so that we can debone the whole job. Operationally the old way wouldn’t work because it is just not sustainable. So that’s why we went –we’ve got to take this so that we can get all or as much of that as we can.” [Managing Partner, Company C]

The managing partner has made considerable investments in technology to improve its productivity in line with the government’s call to upgrade workers’ skills. It continually aims for efficiency improvements in its processes and routines. Employees are encouraged to update software to the latest version whenever possible to improve speed and performance. The company purchased an ancillary
business in the graphics segment which helped to generate some free cash flow. With improvements in its sales and marketing initiatives, the company gradually improved its design business revenues in the recent three years. The global financial crisis had triggered a change in his managerial cognition so that he worked hard to realign the firm’s strategy to focus on sales in emerging foreign markets. The company has made significant improvements in its revenues and its solutions have gained considerable traction in several emerging markets.

4.2.3.2 Description of firm expansion and knowledge accrual from the operating environment

Most managerial team members had previous work experience in companies with business dealings abroad. The managing partner gained extensive experiential knowledge from his time spent as head of other companies and by working with other highly successful serial entrepreneurs.

“I think part of the problem Singapore has is that we can be basically good enough for Singapore. Inherently, that’s not very good. It should be that you’re good enough for anywhere because everything should be global”. [Managing Partner, Company C]

The firm had long focused its sales efforts on its domestic market; however, the FTA changed all that and the managing partner concluded that there was little hope for any significant growth by remaining in Singapore. Thus, he
demonstrated experiential learning by taking the company’s stagnation in the
domestic market and looking for opportunities in higher-growth emerging markets.
“So the objective was to be from Singapore, and grow outside of Singapore. I
think the reason why most people expand out of Singapore is that it’s not really an
expansion of their base business but an adoption of an opportunity that’s better
than their core business.” [Managing Partner, Company C]

Three years after the firm’s initial decision to focus on foreign markets, the
managing partner affirmed that their decision to grow outside the small Singapore
market has been the correct choice. The company has found it easier to sell its
designs in foreign markets, which was getting difficult in its domestic market
since the financial crisis and deregulations.

“I wouldn’t say we’ve found success. We’ve found less failure. We’ve found – the
biggest thing that we learned in the market was because they don’t have a
massive invested history in the infrastructure of Singapore, they’re not so
biased to repeating it. So you can actually have a much more practical fact- based
discussion with designers where here it’s almost like a religion debate.” [Managing
Partner, Company C]

The company demonstrated experiential learning as it tried to enter foreign
markets and encountered significant barriers for which it had not been prepared
for. The firm chose to cut its losses in some foreign markets as other markets
presented opportunities that proved easier to penetrate.
“We tried so hard in India. We won bids, we went back and forth, but India is just not our market. It’s hard because it’s entirely a government procurement process which takes a very long time. China, on the other hand moves much more quickly which suits us. So anyhow we were completely wrong on India.’ [Managing Partner, Company C]

4.2.3.3 Evidence of change triggered by uncertain external environment

Understanding that the firm’s strategy was not achieving the expected results at the onset of the financial crisis and deregulations, the Managing Partner demonstrated a clear cognitive intent to grow outside the Singapore market.

“Right, but when I came back we had absolutely no money and my assessment was that we had absolutely no opportunity. The only reason I would come back to the organization was if it was agreed we would never pursue another account in Singapore” [Managing Partner, Company C]

The process by which the firm researched and targeted its markets demonstrated thought, caution and attention. The managing partner’s justification for choosing the company’s initial target markets allowed for margins of error, whereby a negative experience in one country would not bleed over into another target market.
"When we looked around we saw that the GDP growth isn’t here, it’s going to be over there. And the bulk of the world population who need the infrastructure badly aren’t here, they’re over there. And so the only reason to be here is because it’s where we originated, not because it should be sustained here. On that basis we said ‘Let’s pick 10 countries to try, so that if we’re wrong in India, we won’t have any bleed over effect in Vietnam. And if we’re wrong in Vietnam, it won’t have any bleed over effect into China.’" [Managing Partner, Company C]

The company developed an innovative use of its network ties by having individuals as commission-based marketing agents to secure leads, which has perhaps helped upfront costs for the company in the early stages of expansion. These individuals used their network ties to identify opportunities and arrange meetings, thereby opening doors for the managing partner.

“ In Shanghai we have a guy that used to be the Singaporean executive director of the Economic Development board as our consultant. We have the same thing for people in Vietnam – we gave up the one in India. So we find some very senior people who don’t make necessarily any income from us until they get projects we close. So they are introductory sources”. [Marketing Director, Company C]

The company also piggy-backed on Singapore’s positive reputation and used trade missions as a means to open doors in the emerging markets they had targeted. The company understood the implication of trying to penetrate foreign
markets and made the necessary investments to pursue opportunities in the markets they had earmarked.

“All we had was that we’re in the design business and Singapore-based designers are seen as functional and produce workable designs. And so we used every trade mission as a method to open a doors. Depending on what you’re selling, it is the most – we’re perceived as credible designers.” [Managing Partner, Company C]

Furthermore, the company understood the costs and implications of being a design and build solutions provider, especially in emerging foreign markets. The firm made the change to its revenue model to become the agent in the value chain. This was demonstrated by the planned investments in support processes that allowed the firm to finance its ongoing projects and capture a larger return.

“To become incorporated in the country, finding appropriate sub- contractors and follow the whole process of the project – that part is not cheap because it can take a long time, maybe 2 year or more. And the cost goes way up. So one way that Singaporean companies fix that problem is to subordinate to a big company and just sell a piece of it.” [Managing Partner, Company C]

The interior design arm of the company had always been resource intensive and its burn rate continued to cause financial concerns. Furthermore, the company’s sale cycle in foreign markets was long, often exceeding 24 months. The last
12 month portion prior to foreign clients singing their contractual agreements was especially difficult for the company to finance. To overcome this recurring problem, the company established a foreign subsidiary responsible for securing its own projects independently.

As a response to the nature of its service and the complexity of being a system integrator in a foreign country, the company began following a routinized approach when entering a new foreign market by which it established a subsidiary in the foreign market. Thus, the company began formalizing its process in setting up new businesses.

“I think that in every country you have to create a legal entity which if you’re going to try to do a systematic thing, you have to have the ability to contract, which means you have to have tax identification numbers, everything. So you have to do it properly.” [Managing Partner, Company C]

Furthermore, as a means to adapt the firm’s service production and delivery processes to its various foreign markets, the firm implemented systematic ways of tracking and managing information. The company formalized its knowledge management processes to allow it to learn from its international operations.

“Probably the best thing that’s happened is that they’ve really focused on systems. How the resources are allocated to work on things, and the internal
processes. We now have our own process of gathering information on the costs accurately." [Financial Controller, Company C]

Instead of hiring individuals outright to learn about the solution and market it, the managing partner made a point of being the one to sell the first solution in each market the company penetrated as a means of gaining market knowledge. This initial marketing process abroad also helped determine which individuals would be best to hire and manage the process in that particular market, thus attracting and selecting candidates with the particular knowledge and experience the company required.

“ I told the team that we are going to have to go to each market and work on the first job ourselves and understand the regulatory framework, the design practices–whatever it is. And once we have done that, we’ll hire the people to repeat it. And we learned through that process what’s workable. And what happens is that the people who gather around as you grow become the people you want to hire to run the operations.” [Managing Partner, Company C]

To capitalize on the advantages the company could gain from independent foreign-owned entity, the managing partner foresaw the need to decentralize the organizational structure and give additional responsibilities to each office. He provided insight into how this could significantly reduce operational costs and increase efficiency.
“It makes sense that if you have a competent party running China, my opinion would be you’d localize the team. In Singapore, we pay 5 times the salaries. And I think they’re less productive in Singapore because we have way more vacations and stuff. I think we should, we might shift the heavy lifting work to China and just do the conceptualization work in China, and control them from Singapore.” [Managing Partner, Company C]

The company understands that the costly investments made in each foreign market they have entered should be capitalized upon; however, they do not have the appropriate processes in place to seize subsequent opportunities in these markets because of their limited resources.

“Even in a company our size –you lose focus if you don’t maintain the right mix of people. I’m probably the most concerned person in the company about subsequent sales in the countries we’ve succeeded in because I think that the hard work is to get the first one, the orderly work is to build the rest afterwards.” [Managing Partner, Company C]

Furthermore, the company realizes that it has encountered severe limitations, particularly in terms of its ability to respond to potential opportunities, because of its lack of suitable human capital adapted to the markets in which it has invested. At the time of study, the company had yet to rectify this problem.
“Probably the biggest challenge is to always have enough people with the right language skills that you can afford. Because going overseas, you know we had to hire Chinese speaking people. So that was a big headache.” [Managing Partner, Company C]

Prior to expanding overseas, the company encountered difficulty in growing its domestic market on account of the deregulations. In light of the nature of the service the company provides and the growing need for infrastructure in emerging markets, the managing partner believed that by entering foreign markets, he may have opened new doors for new growth opportunities.

“I don't have to spend a minute explaining the absence of infrastructure in Vietnam to anyone who has lived or been there. You’re sitting down here in Singapore and someone's looking down at Marina Bay and all the glass towers are shimmering, and you’re trying to explain sustainable designs that don’t exist in other countries and they’re never been there. They just don’t get it.” [Managing Partner, C]

4.2.3.4 Evidence of changes in cognition and capabilities

The managing partner’s cognition was greatly influenced by the operating environment- it had motivated him to strike out early on in his career. He was frustrated when he saw opportunities for unique design opportunities that his former employer had not been interested to pursue and it was the impetus that compelled him to start his own firm to focus on them. The opportunities he
identified heavily influenced the strategies of his company which had focused on the design of modern mass housing. He felt that there was going to be tremendous demand with the fast growing affluence of middle class Singaporeans.

Firm C's managing partner had very strong convictions about how relationships with employees are managed and had developed an innovative human resource program which includes recruitment programs within the community and training programs, such as the mentoring system where employees are assigned a mentor. The mentor’s role is to ensure the new employee learns the ropes and to ascertain this person’s level of fit and alignment with the organizational culture.

He explained: “If a new employee does not perform at a level equal to or better than everybody else on the team, the mentor will need to send out a message to us [management] that this new employee may not be a good fit for the firm.”

These mentoring and reward programs appear to contribute to the development and retention of young professional staff at the company.

Firm C’s managing partner had the cognitive conscience to try giving back to the community by devoting firm resources to causes of importance to him especially women in need and young people with disabilities.

“Our Managing Partner spends a lot of time on cause he believes in. He often works with the government agencies to provide community placement
opportunities within the firm for women in need and disabled people.” [Marketing Director, Company C]

“He also tried to nurture a learning environment by investing in training programs He’s really keen to improve job and language skills and reward employees for their contributions. Even though they can be costly to the company” [Financial Controller, Company C]

Cognitively, the company believed that equipment suppliers provide the latest information on new technology and competitor activity and following their advice, has made considerable investments in technology to increase productivity. It continually aimed for efficiency in its processes and routines. Its employees are encouraged to update software whenever possible to improve performance. The managing partner monitors the performance of his staff regularly. He would take the time to mentor young professional staff, but also feels he does not have the right.

Informal processes for identifying the changing needs and desires of clients dominated managerial cognition at Company B. They were not systemized, and employees were rather expected to keep track of new technology and competitor activities in their daily work. The value of close relationships with clients, consultants and suppliers in fuelling the development processes was evident in the company.
“Clients and consultants contact us to touch base all the time. They have opinions on everything since it is their project. This is more important than surveys. We let everyone go as far as they could and be back to talk about what they heard. The only instruction was to listen to what people were talking about.” [Managing Partner, Company C]

The most formalized strategies for prioritized design ideas at the company were internal brainstorming sessions over dinner and drink every now and then. 

The firm’s key contributor to expansion was its graphic business potential, mostly focused on attracting revenue streams from clients. Decisions about projects were, in general, made at the operational level, in other words by the design director and his team. Decision-making protocols were often based on coincidence, relationships and gut feeling. However, with regard to larger projects, decisions at the firm were made by the managerial team comprising decision-makers from different functional areas of the firm. The managing partner focused on encouraging staff to work more with more social networking tools, leaving sales and financial responsibility with the team leaders.

“It’s the gut feeling that decides, it’s – “this could fly!” or “no, this wasn’t good”. [Design Director, Company C]

“*We have a concrete ambition to develop the graphics business and to create a clear business plan that’s not only about becoming better at design and earning a bit more money ... I guess you could say I’m the center of things and involved in*
“Everything really, from networking, sales to finding new business models, to allocate money to prioritized projects.” [Managing Partner, Company C]

The firm launched a new special projects department in 2008, shortly after it had bought out a small boutique design firm. Previously, the knowledge-transfer and synergy effects of designs were mainly in the hands of the small team. The new managerial team wanted to change this but had not yet succeeded in implementing new procedures such as town-hall meetings. Other reasons for establishing the new centralized managerial team included the need to gain control all parts of the firm, and to be able to prioritize the design production and thus improve the firm’s business in general.

“Design services over the internet has always been difficult to work with… we need to be diplomatic and almost political and show that it actually isn’t that difficult, but even easy and fun and that there are many advantages”. [Managing Partner, Company C]

In the earlier stage of its growth, the company did not prioritize the use of any new technologies within the firm. Neither did the company deliberately absorbed new technological knowledge from external sources or develop new technologies internally. The company had capabilities to identify new market segments and client needs, and absorbing knowledge from client innovations. Thus the company often uses well-proven low-risk technological solutions that have already been implemented by other firms. Cognitively, it viewed its strategy as not comprising
any radical implications as far as its first-order capabilities and internal competencies are concerned.

4.2.3.5 Capability assembly process- cognition of capability and capability salience

This cognition changed in the early 2000s when firm performance declined due to foreign competition at the onset of the FTAs. This led the cognitive reality that the firm needed to develop new services and expand to new markets if it were to survive. The managing partner began to invest heavily to upgrade the skills of its staff and its technology. He introduced training program and technology and business development efforts. He also leveraged his network of friends and associates to identify new opportunities. He also leveraged new knowledge by being the first design company in Singapore to invest in rapid prototyping systems. It invested in its first rapidography in 1999 before the advent of the 3D printers as well as in early iterations of image output devices.

These technologies allowed the firm to process solutions in much greater volumes with significantly reduced time periods. The technology also eliminated many of the traditional skills required for origination services and replaced them with entirely new skill requirements. These activities brought about a change in the nature of learning at the firm and in the process, modified managers’ perceptions and capabilities.

In this context, the issues of cognitive importance to the managing partner changed at the onset of the FTAs, which was dominated by the changing nature
of the design industry and the need for the firm to change to adapt. The priorities shifted to expanding out of the local market leveraging on the managing partner’s network to gain relevant information, access and industry knowledge.

The services of the firm evolved from the provision of ‘mass market design services to clients in Singapore into the provision of specialized design services to multi-national clients in Singapore and a number of countries. Skills were retooled through on-going investment in staff training, and the adoption of new technologies. While some of the client relationships were long term and involved significant repeat projects, the majority of projects secured were one-off and involved minimal supervision for project management and coordination. Overtime, the firm built a client base in the region, selling design services to larger institutional developers. The firm enjoyed sustained growth through the provision of these services. The transition from competing on product quality based on traditional technical attributes to competing on technologically based production processes, to competing on a new capability in managing the process is indicative of a dynamic capability at the company.

New knowledge and expertise were also absorbed into the firm by individuals who had joined the firm which included the new marketing director. He brought with him experience in business planning and the ability to respond to the interests of the existing clients. He also redefined the decision-making criteria for the managerial team. This led to the development of explicit goals to improve utilization and changes in the firm’s operating procedures. This process caused a
change in the firm’s physical resources, technology infrastructures which enabled them to offer better client service.

A number of senior managers had left the firm in 2005 taking with them years of accumulated experience. New hires replaced them. The managing partner developed new strategic goals and appointed a new managerial team thereby modifying the resource base. By routinely adding resources, the case firms evolved at a faster pace than would have been possible if the resources were developed internally. The reconfiguring process also introduced new knowledge and mindsets. Grafting at the managerial level reduced the firm’s engagement in repetitive path dependent routines that freed the firm to implement change over time. The grafting of information and knowledge from external sources often leads to faster acquisition than would be possible from experience (Huber, 1991). The capability to combine resources in new ways alters the firm’s resource base.

Managerial cognition of the managing partner caused the development of particular resources or capabilities that he felt was important personally. Thus he invested in initiatives that may not have direct influence on firm profitability. The managing partner tried to giving back to the community by devoting firm resources to causes of importance to him (women in need and young people with disabilities). He worked with local agencies to create community placement opportunities within the firm for women in need and disabled people. He also tried to nurture a learning environment by investing in training programs to improve job and language skills and firm gatherings to reward employees for their
contributions. Similarly, although these activities do not directly impact firm profitability, they were the result of managerial cognition of the managing partner.
<table>
<thead>
<tr>
<th>Managerial cognition</th>
<th>Managerial choices and actions taken to assemble capabilities</th>
<th>Evidence of dynamic capability assembled</th>
</tr>
</thead>
</table>
| Cognition of capability purpose  
- Identify purpose for which capabilities would be assembled  
1. Problem cognition- Managers perceive organization shortcoming or gap in performance relative to strategic goals  
- Managerial learning about nature of the problem  
2. Cognition of impact on firm capabilities | Financial crisis and deregulation caused managing partner and management team to be concerned about shrinking work opportunities. Cognition shifted to expanding to emerging markets  
- Concerned about productivity and cognition of need to upgrade staff skills to compete.  
- Managing partner’s cognition about how relationships with employees are managed  
- Managing partner’s cognition of need to involve in community activities to nurture learning environment | Managing relationships with employees  
- Employees constantly generate creative solutions  
- Maximize efficiencies and contain costs  
- Staff are motivated and turnover is low |
| Cognition of capability salience  
- Understanding what the firm can do  
1. Managerial knowledge of what the firm can do from previous experience in executing routines  
2. How managers compare and benchmark strengths of the firm with the competition | Managing partner constantly reviews staff performance to ensure fit.  
- Cognition of insufficient qualified personnel in key managerial positions  
Action to recruit talent to reconfigure capability  
Company’s skills at human resource programs  
- Community placement programs  
- Mentoring and reward systems  
- Ensure staff fit and alignment cognition  
- Create learning environment  
- Investments in technologies to support firm operations | |
Table 4C-2: Company C - Summary of learning and change in response to operating environment

<table>
<thead>
<tr>
<th>Change triggered by uncertain external environment</th>
<th>Evidence from company of managerial choice and action</th>
<th>Demonstrated changes to operational capabilities, routines and resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification of dynamic capabilities</td>
<td>Strategic decision to expand overseas as a means of counteracting limited growth in domestic market</td>
<td>Fundamental changes to the firm’s service production and delivery processes Additional resources necessary to adapt services to foreign markets</td>
</tr>
<tr>
<td></td>
<td>Participation in trade missions and partnering to promote the firm and its services</td>
<td>Required resources to be allocated to this promotional process, notably financial resources and the founder’s time and presence</td>
</tr>
<tr>
<td></td>
<td>Change in firm’s revenue model to become a design and build integrator, thus providing the complete solution</td>
<td>Creation of new operational capability for service delivery process to support the processes associated with project management</td>
</tr>
<tr>
<td></td>
<td>Creation of foreign subsidiary in each foreign market concurrent to initial wind of project</td>
<td>Fundamental changes to the firm’s service production and delivery processes</td>
</tr>
<tr>
<td></td>
<td>Creation of system for knowledge codification and systematic knowledge management</td>
<td>Impacts service production process</td>
</tr>
<tr>
<td></td>
<td>Creation of an initial sales process in the firm’s foreign markets</td>
<td>Allows for the acquisition of experiential knowledge Development of the managing partner’s network and impact on</td>
</tr>
<tr>
<td></td>
<td>Decentralization of service production and delivery processes to foreign subsidiaries</td>
<td>Changes to operational processes of head office, decrease in human capital costs</td>
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<tr>
<td></td>
<td>Choice of foreign markets in emerging countries</td>
<td>Impact on sale process and service delivery</td>
</tr>
<tr>
<td></td>
<td>Extensive use of network ties to access project opportunities in emerging markets</td>
<td>Impact on sale process and service delivery</td>
</tr>
</tbody>
</table>
4.2.4 COMPANY D

4.2.4.1 Description of the Company

Company D was founded in 1998 when it then employed nine individuals. At the time of the study, it had 95 employees. Company D is the second youngest firm in the sample. All managers had all completed graduate studies, holding at least a Master's degree in their fields. Most consultants working with the Company had specialized Master’s degree in their area of expertise. The company grew by hiring project managers and high quality technical staff.

The company has offices in Singapore, China, Vietnam, Malaysia, Indonesia, India and representative offices in other parts of the South-east Asian region. The managing partner got a much needed change in his career path when in 1997, he won a highly-publicized commission to design a national heritage centre. He then built a new firm to specialize initially on building conservation projects which was then an under-served segment of the market at the time and the necessary expertise was lacking amongst local firms. He is a health and environment conscious individual and had recognized early on the presence of a market for sustainable residential designs that was not being served by any of the competitors. This ultimately drove him to leverage his capability in conservation and adaptive reuse design to focus on this market deficiency.

The firm evolved over the years and diversified its activities into emerging areas, particularly in sustainable adaptive reuse projects. Between 2001 and 2004, it
refined its service offering and repositioned itself as an environmentally-focused design services consultancy although it offers a whole suite of design services. The company went through its first formalized strategic planning exercise in 2005.

By 2009, in response to the global financial crisis of 2008, the firm had repositioned itself by making significant research investments in building its practice in design sustainability within the Asian context and disseminating the knowledge it had accumulated, which provided clients with far more unique and specific area of expertise than had been available in the design industry at the time.

“We did all of that research which raised our profile internationally, because our delivery was much more detailed than other companies in the design sector that were based in Singapore. We were considered leaders on the sustainability consulting. So that raised our profile and helped us secure projects largely within Singapore but also from companies in the region.”[Managing Partner, Company D]

The company has a clear organizational structure where individuals are well aware of their specific roles and responsibilities. The organization was characterized on multiple occasions as “value-based” and pays considerable attention to and cares for its employees. Its organizational culture promotes innovation and initiative, and employees share the objective of creating change and having an impact.
“It’s our people and so it’s people that are values-driven, that want to create change, and then our goal is to create a consulting Company that helps us all do that. There are a lot of people that work in this space that talk about sustainability. We walk the talk.” [Managing Partner, Company D]

4.2.4.2 Description of firm expansion and knowledge accrual from operating environment

The firm expanded overseas opportunistically and continued to expand subsequent to the completion of its initial legacy projects. As the company has worked with multinational companies, JVs and state-owned enterprises in the region, the services it offers are intrinsically international in nature because of the scope of its clients’ firms. Thus, its services are often produced in a variety of contexts.

“There are firms that are international in nature and the project may be run from a Singaporean office perspective but it engages a wide variety of people around the globe.” [Senior Partner- Design, Company D]

Although the company’s reputation crossed the domestic border, managers had a good understanding of the investment in time and resources international activities required, and decided to take an opportunistic approach to international projects.
“We’ve always prided ourselves on the quality, the depth and the rigor of the work that we do and those values have driven our business. We strive to achieve work-life balance as much as we can in a design firm. The consulting business is a hard business to be in, you have to work very hard to generate new revenue, margins and so on. If you have overseas operations, that adds a whole other dimension to that. It’s a deliberate limiting factor for us” [Managing Partner, Company D]

As the practice of sustainability in the design industry evolved and matured, the management team also recognized that expanding to emerging markets would not necessarily allow the firm to use its contextual knowledge base, given that its expertise was centered on the Singaporean environment.

For a local firm entrenched in the Singaporean context, we can probably operate in most geographic regions and in particular resource development regions although it may not be easy to transfer our know-how to those places.” [Managing Partner, Company D]

4.2.4.3 Evidence of change triggered by uncertain external environment

The financial crisis in 2008 instigated a strategic revision, at which point the company identified areas where it could achieve better performance and in which it could focus its knowledge development efforts. This was not the firm’s first strategic revision; it undertook an initial strategic exercise in 2005 and had completed a third in 2007. The result of the strategic revisions in 2009 was the
implementation of a sector strategy that was still in place at the time of the investigation.

“We aim to create a situation where we’re not pushing our services but it’s the market that’s coming to us. And I think particularly now that we’ve made this renewal strategy, we’re not trying to grow and take over the world, that’s what it’s feeling like more again. That why we’re not putting as much effort into business development. We can make the investments in our knowledge areas and keep on the cutting edge and the work will come to us.” [Managing Partner, Company D]

Not only has the company focused its efforts in particular markets, it has also invested in innovating and improving its services. The company has leveraged its experiential learning, and built on the knowledge it has acquired during each project to improve its services.

“That is work where we did all of that research, put the research out there then started providing advice on their sustainability projects and then we continued to build on that. So with each subsequent client that we’re working with we’ve developed all of the benchmarking that we’ve been doing and each subsequent project is more sophisticated than the previous one.” [Managing Partner, Company D]

“When we first started, environmental designs were hot and then sustainable environmental systems were the thing. What’s happening now are more
integrated systems. We’re taking that core competency and applying that to integrating for a client in terms of how they establish those things.”[Senior Partner, Company D]

The managing partner invested in the development of a culture that promotes design innovation. Some of the cultural traits present include: encouraging continuous improvement, creative thinking, and organizational stretch (e.g., not being satisfied with the status quo). Continuous improvements have also been made to the services’ production and delivery processes. The company has invested heavily in research and development which the managing partner described as being “the blood of the firm.” Firm D employs eight people in R&D, which is considerably higher than most firms of comparable size.

The Technical Director provided accounts of times where they incorporated previously acquired experiential knowledge to improve the service production and delivery processes.

“Often times the approval process by the local authorities can get really protracted. Singapore firms are generally faster at it, having gone through the learning curve earlier. The large, international firms take much longer. We have applied some of the lessons that we’ve learned at the Shanghai Xintiandi project to other projects with our Chinese clients.” Technical Director, Company D
It is also evident in his descriptive accounts that employees informally share experiential knowledge among the teams. From his accounts, it is reasonable to conclude that shared experiential knowledge has been integrated into project management processes to reflect the acquired international knowledge of others.

“So my colleague who does a lot of work internationally talked about the need to convey the same information to the other teams. Making sure that you’ve got stuff in writing, and then follow up by saying the same thing verbally and also trying to provide illustrative examples of what you’re talking about because of the varying language and cultural barriers. The more ways you can present information the better, the more it’s absorbed.” [Technical Director, Company D]

Although the Company possesses knowledge management processes, both the managing partner and technical director recognized that this is an area of concern in the organization. As the company continues to grow and offices are created, it recognizes the need to codify parts of its knowledge base.

“We also struggle with knowledge management and how we can institutionalize these learning and make them easier to access and – from employees that are starting to be – we’re starting to have more remote offices, so they’re not talking to us informally in the same way, so how do we capture to share with them? But also over time we’re finding when we were first formed, we had people who were here for more than 5 years and that – I mean we’re still retaining the same people after many years but there’s more turnover than we’ve had in the
past. So how then do we maintain those learning when people are leaving and we don’t have the formal systems to capture them. It’s an area we’re thinking about a lot and could be doing more.” [Technical Director, Company D]

4.2.4.4 Evidence of changes in cognition and capabilities

Although the company has formalized certain operational processes, notably those surrounding the services production and delivery processes, it has yet to systematically seek out new clients and projects.

“We’re passionate about the issues and we want to do stuff. We’ve all had to make a special effort to learn and to execute around the business development side. For the first few years we didn’t have to worry about it much. The work just showed up, the phone would ring and we’d get contracts and so on. But because we were small and growing, and there were only so many of us to go around, you very rarely are in that sweet spot of doing all of those things just at the right level of efforts. It’s the typical we do it well, we get really busy, we deliver, we run out of clients, and gosh, we have to do it all over again so we come up with a whole new way of doing it.” [Managing Partner, Company D]

Foreign projects have often been taken on opportunistically as they have become available to the firm through its existing clients as repeat sales or via referral through its network ties. Also, the managing partner provided evidence that projects completed domestically have often opened the door to new projects, given the international scope of its clients. However, the company has yet to
define or formalize a process by which it can capitalize on future foreign projects.

Although the importance of their existing clients and network ties was recognized by the company’s managing partner, the management team had yet to formalize an approach to maintaining client relationships. It also experienced negative repercussions from the acquisition of a smaller Singapore firms, as once acquired the Company often lost its contracts and opportunity for repeat sales.

“We aren’t very sophisticated or systematic in terms of our approach to maintaining long-term clients, but our two biggest clients have been clients since the beginning of the firm’s founding. And then we have others like that. If you look at the turnover of clients there’s a lot of long-term relationships that we’ve been able to maintain and we’ve acknowledge that in our strategy. That we should formalize that a little bit more, and that we should be coaching and mentoring our people, because it’s something we do well but we haven’t formalized.” [Managing Partner, Company D]

The company prides itself on the quality of the services it offers its clients and has recruited expert knowledge when the expertise has not been available in-house. This process of learning by doing has proven successful, as the company lists several associates on its website with impressive résumés from whom it could seek out expert knowledge. Evidence also point to the fact that that the company
has made investments in its physical infrastructure to improve the service production and delivery processes.

“I think that we also learned that having the most current 3D visualization capabilities to sell our designs. We have upped our capabilities over the last couple of years. That is inherent in just being able to see people’s body language when you’re never going to meet them face to face, being able to see people’s body language in connection to the work that you’re doing together has been very important.” [Senior Partner- Design, Company D]

The managing partner was greatly influenced by the external environment in that it provided him with the stimulus to start his own firm. He had been looking for a change in his career path and recognized the opportunity when he saw that the changing client tastes and preferences had not been served by other local firms. Here the opportunities identified from the external environment shaped his managerial cognition which in turn, influenced the product-market strategy adopted by the company. The company has responded to the changing socioeconomic tastes by focusing on modern, minimalist, steel-and-glass aesthetics for their clients. It also designed compact and convenient housing type and produced a full line of hip, trendy and compact flats to appeal to their “yuppie” clients.

“Singapore has changed a lot different now, people travel all over, they see what’s happening in Europe and the U.S. They are keen on lots of steel and glass these
days. We’ve have had to adapt to that, which is good for us.” [Managing Partner, Company D]

The managing partner is a health conscious individual and also recognized the market for lifestyle residential designs that was not being served. This cognition influenced him to utilize his skills as a designer to focus on this market deficiency. He loved being in the public eye, which has influenced the way the firm has achieved its growth objectives. He constantly pursued awards from various agencies and then used these awards to build the firm’s name and reputation within the industry. Awards are listed on its web page and illustrated on the back of business cards.

“Oh, awards we won plenty. It certainly helps to raise our profile.” [Managing Partner, Company D]

Managerial cognition of the managing partner has also influenced the company to invest in initiatives with no positive impact on firm profitability. He was committed to protecting the environment, and to making his employees feel they were valued and respected. He devoted firm resources to initiatives that he perceived as protecting the environment such as providing employees with MRT/bus passes to discourage them from driving to work. He tried hard to create a work environment where employees would feel they were valued and respected such as throwing individual birthday parties and organizing group retreats to faraway places. These initiatives were important to the manager given his own cognition.
Managers at the firm kept close to their extensive networks of contacts, which include suppliers, competitors, university researchers, and partner firms, as a means of staying abreast of developments and issues in the industry. Managers indicated that suppliers and contractors are an excellent source of current market and technical information.

The managing partner has aggressive growth objectives, and regularly assessed his firm’s ability to meet targets. He took stock of options available to ensure that the firm was able to meet its growth objectives and he evaluated these options within the overall context of firm’s strategy. His objective was to be a global leader in innovative design products to meet the needs of a healthy lifestyle. So he focused on expanding China-based sales through the operations of regional design offices in gateway China cities.

He also expanded aggressively into new markets and to penetrate the main cities of the China market. The company broadened its product offerings by introducing new innovative designs within its existing niche markets. The company had progressed from a boutique firm to partnering with other firms and undertaking acquisitions. It progressed from an initial niche market to large partnerships with extensive networks. The managerial cognition of the managing partner shifted from being a local player to an international value-adding design firm.

As the managing partner was previously an employee of one of Singapore’s larger design company, he was familiar with negotiating partnerships with major
international firms. The business idea was he would act as a local partner for the large MNCs in Singapore. This provided an attractive business opportunity for foreign firms entering the Singapore market. Driven by the needs of its large clients, the company entered the hospitality arena. Initially it provided consulting, and technical support for the foreign firms. This role expanded to the other countries with a number of leading foreign firms. Soon, however, the management team recognized the need to develop their own specialist know-how to spur further growth.

The managing director decided to invest heavily in growth and systematically expanded its organization, both organically and through small targeted acquisitions, to 95 employees by 2011. Company D extended the scope of its integration activities more broadly to broad areas of consulting. After 2007, its own design development gained increasing emphasis.

“We focus on design areas where there are gaps left by market-leading companies. Our strategy is to expand sales, support, service and marketing organizations by utilizing our partner channels and continuing to invest in our capabilities.’ [Managing Partner, Company D]

When the markets declined in 2008 as a consequence of the global financial crisis, the managing partner perceived a problem with the breadth of the company’s portfolio of businesses. He launched a strategy to focus only on the
lifestyle businesses while emphasizing the company's own research and development.

“We focus now on the hospitality design business in markets all around the region. This expansion requires new types of management skills.” [Managing Partner, Company D]

The Managing Partner of the firm commented on the firm's strategy:
The Company underwent the biggest change during the financial crisis. As a result, our operations were renewed in terms of both quality and the business environment. We were transformed from being a local boy to being a real player in the region [Managing Partner, Company D]

Later, the managing partner shifted the company focus from being technically-based to a stronger emphasis on managing client relationships.

“We try to really listen to our client and taking their expectations increasingly into account in our product development and other operations.” [Managing Partner, Company D]

The financial crisis had precipitated a change in managerial cognition towards transforming its capabilities to focus on new product development in a declining local market, while seeking growth in external markets.
Since the company’s founding, consultants and experts had been the key people in the company generating and executing the firm’s strategy. It formed a managerial team with a new group of experts taking an active role to search for expansion opportunities in the markets. The Company occasionally organized internal brainstorming sessions, and hosted functions to obtain clients input. Managers continually studied their competitors, industry benchmarks and technological development as part of their daily work.

“We follow what is happening in the markets all the time … the first thing we do is to turn on our laptops, go online and check what other competitors are doing and constantly monitor their projects”. [Managing Partner, Company D].

The managing partner made all key strategic decisions although he relied on advice from the managerial team and consultants. This changed, however, and when the managing partner felt that it was necessary to develop a clear business orientation and delegated some decision-making to the teams to speed the delivery times. However, the decision-making protocols involved committees and at times, this caused confusion and frustration in the company.

“The decisions are made in our team but as we have all these stakeholders, team leaders and so on, we have to listen to their opinions. We have to invite a bunch of people together and that takes a lot of time – too much for the decisions you need to make in designs. Sometimes we simply have to ignore the procedure and make the decisions ourselves.” [Managing Partner. Company D]
The company demonstrates a variety of sensing capabilities: in addition to sharing experiences internally and following the general trends, it co-operates with universities and the industry associations, and actively attend international industry seminars. Client feedback and the performance of its main competitor are monitored daily.

“We pay attention what our clients think, what kind of world they live in and what they are interested in.” [Managing Partner, Company D]

The company continuously reconfigured its capabilities to match its dynamic business. The managing partner compelled teams to work closely together and focus on internal training and knowledge management to keep up with the new decision-making pace.

4.2.4.5 Capability assembly process - cognition of capability purpose and capability salience

The company evolved operational capabilities in technological innovation and marketing to supports its desire to be a global leader in the creation of innovative designs that meet the needs of a healthy lifestyle. Its capability in marketing innovation helps it to develop innovative designs for markets in Singapore and China and distinguish itself from other competitors. The capability supported its aim to “compete on superior designs and technology and by dealing with entirely modern approaches.” This contrasts with the majority of its competitors which
produce standard mass market housing types, by developing, producing and marketing innovative designs.

The culture of mutual respect at the company reflected the managerial cognition of the managing partner. There was evidence that company has been successful in creating an environment where its staff felt that they are valued and respected. The managing partner has reinforced this perception by sending employees cards on their birthdays, providing numerous team-bonding activities for employees, rewarding employees for longevity of service with a paid vacation for their family, and other perks.

“Oh, he [Managing Partner] really cares about the staff, he personally organizes birthday cakes and cards for them. Not many bosses do that” [Technical Director, Company D]

The company identified technological/design innovation and marketing innovation as areas of strength. The managing partner made investments in tangible resources by seeking out the “brightest and most capable” technical team to support its capabilities in technological/design innovation. Its design team includes two doctorate and ten master’s level architects. The firm has been able to attract talented individuals as it has developed a reputation for innovation within the design and academic community, as well as relationships with key individuals in the architectural and academic community.
It built relationships across the scientific and technical community to support its capabilities in technological/design innovation. The Director of Research and Development is an Adjunct Professor, knows the Head of the National University of Singapore’s Architectural department as well as well-known universities in Australia and the United States and has established strong relationships with local universities and technical institutes.

As the Technical Director of Research and Development explains,

“The firm is of the size that it is looked favorably upon for government grants and things like that. We actually have an excellent rapport with the Ministry of National Development.” [Technical Director, Company D]

The company has also invested in the development of a culture that promotes technological/design innovation. Some of the cultural traits present include: encouraging continuous improvement, creative thinking, and organizational stretch (e.g., not being satisfied with the status quo). It also established relationships with input suppliers, particularly the technical staff from their suppliers, as they view these individuals as being excellent sources of information. The managing partner encourages the members of its technical team to be proactive in their daily routines. To this end, the firm has invested in a computer system which links staff to approximately 10,000 journals so that they can stay abreast of developments in the architectural community. As the Director of Research and Development explained, the technical team is expected to “look at
other technologies and how these technologies can be incorporated into what the Company is currently doing."
Table 4D-1: Company D- Cognitive processes in assembly of capabilities

<table>
<thead>
<tr>
<th>Managerial cognition</th>
<th>Managerial choices and actions taken to assemble capabilities</th>
<th>Evidence of dynamic capability assembled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition of capability purpose</td>
<td>Founder started firm when he won high-profile commission. -He is a health and environment conscious individual. -managing partner is committed to sustainability leadership and devoted firm resources for this cause</td>
<td>Marketing capability -successful in marketing the adoption of its designs abroad -Aggressively sell its innovative mid-range design alternatives for markets in China</td>
</tr>
<tr>
<td>1. Problem cognition- Managers perceive organization shortcoming or gap in performance relative to strategic goals</td>
<td>With the financial crisis and deregulations, he was worried about falling revenues -cognition shift to reconceptualize product offerings and expand R&amp;D efforts</td>
<td>Technical innovation capability -used technical know-how to expand its range of designs for alternative health lifestyles -continual investments in R&amp;D activities</td>
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<td>- managerial learning about nature of the problem</td>
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<td>2. Cognition of impact on firm capabilities</td>
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<tr>
<td>Cognition of capability salience</td>
<td>-the firm has built up a strong database of detailed client information -extensive links with universities and research councils -strength in securing research grants from government agencies -large R&amp;D team (eight doctoral/masters level researchers) - has built up strong reputation -expertise in environmental sustainability</td>
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<tr>
<td>1. Managerial knowledge of what the firm can do from previous experience in executing routines</td>
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<td>2. How managers compare strengths of firm with the competition</td>
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<tr>
<td>Change triggered by uncertain external environment</td>
<td>Evidence of managerial choice and action</td>
<td>Demonstrated changes to operational capabilities, routines and resources</td>
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<tr>
<td>Modification of dynamic capabilities</td>
<td>Implementation of a sector strategy</td>
<td>Modifies use of knowledge assets</td>
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<td></td>
<td>Improvement of services offered</td>
<td>Impacts existing clients and contracts</td>
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<td></td>
<td>Knowledge management processes</td>
<td>Changes the service production</td>
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<td></td>
<td>Performance evaluation and strategy reformulation</td>
<td>process and knowledge assets</td>
</tr>
<tr>
<td></td>
<td>Sporadic sales and client prospecting processes</td>
<td>Impacts the service production and delivery processes and knowledge assets</td>
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<td></td>
<td>Informal approach to maintain client relationships; affected by acquisition of large foreign brand</td>
<td>Impacts resource planning and allocation processes; can impact service production and delivery processes</td>
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<tr>
<td></td>
<td>Cognition of need and recruitment of new associates with required expert knowledge</td>
<td>Impacts clients, contracts and financial resources</td>
</tr>
<tr>
<td></td>
<td>Creation of new offices in China</td>
<td>Impacts the service production and delivery processes, maintains client relationships and reputation, and impacts knowledge assets</td>
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<tr>
<td></td>
<td>Improvement of physical infrastructure and investment in communication technology</td>
<td>Impacts service production and delivery processes</td>
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4.2.5 Company E –

4.2.5.1 Description of the company

Case E was created in 2000 and employed 74 staff at the time of this study. It is the youngest firm in the sample. During its years in business, the company has experienced rapid growth with low staff turnover and continues to operate without an articulated planned strategy.

“We’re an odd company because we have been quite successful, so we haven’t had to change our ways too much. But I guess a lot of design firms are like that”. [Managing Director, Company E]

The managing director who participated in the study founded the firm. He had an immense competitive desire to build a lasting company of his own. Along with the other principals in the firm, he has developed a regional reputation in the area of sustainability designs. The services offered by the firm include architecture, urban planning and interior design.

The company was created in response to an opportunity in the market. Until the early 2000s, most clients were not concerned with environmental issues but as awareness grew, large companies began to seek expertise in this area. Over the years, the company has not significantly modified its core services, but it has added new services in response to technological needs made evident by its clients.
“Our services haven’t changed a great deal. We’re still doing pretty much the same things. Our competitive advantage then was our knowledge and experience, and the fact that most design firms started cutting back on the sort of in-house expertise. A lot of companies had two or three people that looked at that, but they don’t do that anymore. So they had to hire consultants like us to do that.” [Managing Director, Company E]

The majority of the firm’s projects come from Singapore’s large private developers or from multinationals. The company reports that although it has a lengthy client list, it does a lot of work with a small number of repeat clients. Thus, repeat clients are one of its most important assets, as it has successfully built long-lasting relationships and its network acts as a means of generating new business through referrals.

“More than 70 percent of our business comes from a very small number of people. We have a very long client list but we do a lot of work for a small number of companies and government agencies” [Marketing Director, Company E]

The company is careful not to increase its staff capacity too rapidly, even though it had more opportunities than it could handle at the time of the study. Consultants who have been hired are highly respected in their field and perceived as experts, have built their personal reputations and provided the appropriate credentials with impressive previous work experience.
“We often hear complaints from some of our clients indirectly that the bigger firms are too busy. We can’t give them this work. We’re not even going to request for proposal. That’s not a good sign.” [Managing Director, Company E]

4.2.5.2 Description of firm expansion and knowledge accrual from operating environment

The company expanded into the China market not long after inception in 2000. The Managing Director indicated that over the years the company had acquired experiential knowledge and focused its expansion efforts through winning new projects and maintaining good client relationships by leveraging on the firm’s network ties. The managing director had developed a good understanding of the competitive landscape and determined some of the effects that events and crises in the external environment had on the survival of competing firms, e.g., crises meant attrition of number of competitors.

“We needed to expand out of Singapore as the local market is getting smaller and smaller and smaller even though it’s risky”. [Managing Director, Company E]

It acquired important market knowledge from the China markets, which may explain its focus on the Chinese sources of revenue and limited interest in other Asian projects. The technological knowledge the company accrued over the years coupled with its expertise and intangible assets such as reputation and networks enable it to compete in the markets.
The company explores for new knowledge by learning from its clients. It uses its clients and network ties as sources of external knowledge, which it absorbs and transforms into a dynamic capability: rapid knowledge integration and development of new technological knowledge and capabilities.

“When we started realizing how successful we could be, and the government was pushing hard on the sustainability platform. We realized the potential for that, and we just really developed the capability.” [Managing Director, Company E]

4.2.5.3 Evidence of change triggered by uncertain external environment

The firm operates with efficient expert resources and demonstrates sparse communication and planning of strategic objectives or other routinized investments in change processes. Two dynamic capabilities were identified. Experts in the company often explore for new knowledge in the company’s readily available external network sources. The company has built the capability to rapidly develop new services through internal R&D as a response to the needs identified by its clients. This research has enabled it to build its reputation as a regional expert. The dynamic capability was routinized to the extent that the firm systematically acted upon needs identified by its clients, developed the necessary technological capability, tested and researched, and then disseminated the knowledge in the market as a means of soliciting for new clients and projects.

“We realized that if we were going to deal with the sustainability thing, we had to really know our stuff. We developed that capability and we started marketing it.
Like telling people how important this was. We turned it into a business.”

[Managing Director, Company E]

A recent example of this dynamic capability came from the identification of a new client need with renewed interest in sustainable designs.

“We developed the capability to recycle efficiently. This client that I’ve talked about in China, we’ve done a number of projects for them to help them develop the capability. Like the ability to do sustainability audits, which they had never done before.” [Marketing Director, Company E]

Additionally, the company uses its technical knowledge accrued to fuel its reputation, through which it acquires and maintains its clients. Professionals in the company publish research and present their findings at design industry conferences. Knowledge dissemination is the foundation of the company’s expertise and reputation.

The company managed to win overseas projects without planning a strategy or defining the markets it wanted to penetrate. These projects were done opportunistically, as many of their clients were Singapore Government-linked companies (GLCs). It therefore expanded abroad by developing its reputation and expertise on the subject matter and by continuously working with a select group of companies that required its expertise.
“In terms of repeat business, 70 percent of our business comes from a very small number of people. We have a very long client list but we do a lot of work for a small number of companies and government agencies.” [Managing Director, Company E]

The evidence calls into question the need to develop routinized change processes, as the process of learning by doing over planned investments was sufficient for the firm to capture foreign assignments. That said, the managing director suggested that the barriers were not onerous and the firm’s services required little to no modification to be deliver the projects for its clients. The company explicitly acknowledged that there have been no adjustments to be made.

In general I would say we don’t change our methods of working because we are generally working for multinational companies so it’s not – it’s not as local is it might appear to be. I did a lot of work in China over the years. I went there every year for quite a few years, but it was for a huge Chinese firm.” [Managing Director, Company E]

Foreign projects have often been awarded based on the firm’s expertise, which in turn is based on the developed and acquired technological knowledge embodied in the firm’s expertise. The firm has required little promotion and marketing. Its reputation has been an important asset in winning these contracts.
“People come to us because of what we can do. We get the work because of that. That’s just the way the business is. So, we all speak the same language.” [Marketing Director, Company E]

“I think it came out of the blue. Honestly, no I mean someone knew our capability”. [Project Director, Company E]

The same is true of its network ties. By completing projects in foreign markets, the company has extended the scope of its network.

“We are able to expand our network because all of a sudden we got to work with a bunch of people from the Singapore GIC (Government of Singapore Investment Corporation) that had dealings in China. Some of these companies are very active over there. So that put us in a very good position to bid on the work that we’re doing now, which is this conglomerate.” [Marketing Director, Company E]

The projects that they have completed have also been a source for referral to new clients. Again, by completing projects, developing technological knowledge and disseminating information, the company has fuelled its reputation and strengthened its position as a thought leader in the field.

“I’ve had a couple of projects like that where I was asked to evaluate a several options for investment and select the best one. Actually, maybe this R&D project,
because I know who’s doing all of these different research and they knew I could do it very efficiently. And they knew I had the contacts. I mean I can pick up the phone and talk to every player on a first name basis, so that’s helpful.” [Managing Director, Company E]

The ways in which the company has attracted new clients and won new contracts may explain why it had never formally planned its expansion strategy. Instead, the company focused on leveraging its client relationships. These relationships have been maintained in part with the firm’s technological knowledge. The company’s expertise is used to identify future research needs, which the company can then bid on and meet. Thus, the company demonstrates opportunistic behavior in fostering its client relationships.

“We like to work with them and help them identify research needs and then once a year they have an announcement for requesting proposals and we are eligible to do all of that stuff. We’ve been successful at that.’ [Managing Partner, Company E]

The company recognizes that investments in knowledge, physical infrastructure and technical capabilities are necessary to acquire new clients and maintain existing ones. However, the ways in which the company has gone about making these investments demonstrates trial-and-error experience rather than planning it out.
“We convinced a client to pay for most of it which was nice. We tend to do 
things as we need to and we try to keep things inexpensive which has always 
helped our business.” Marketing Director

Furthermore, the company has overlooked any formalized knowledge 
management processes. Instead, experts have defined their own areas of 
expertise symbiotically, based on what others in the company specialize in. The 
direct and indirect technological experiential knowledge acquired may have had 
an impact on the professional development of the experts, thus impacting the 
company’s knowledge base.

“We do because we each have skills that the others don’t. Or it may have just 
worked out that way. We focused on developing our own capabilities’ which is the 
way it’s worked.” [Managing Director, Company E]

Company E demonstrates a lack of formal growth planning, which may be in part 
due to the fluctuation of demand from its clients, as their needs are often 
regulated by external critical events.

“Over the last ten years has driven the market down such that people have gotten 
out of the business. We have no choice: this is the only thing we know how to do. 
So when the market needs shifted, we were ready to take advantage of it, and we have.” [Managing Director, Company E]
Thus, little planning and forethought have been given to growing the company in terms of adding additional experts on staff.

The firm has had to increase its capacity since external events in 2008 significantly increased demand for its services. To solve this problem, the company decided to hire more experts in the field. This increase in capacity was not planned but appeared to be in response to an internal need to survive.

“Now that’s changed a little bit in the last – There have been some increased agencies that have been ramping up efforts in the area. So we have increased capacity in the last year or two to prepare for that and just to keep up, keep our heads above water. We’ve been working very hard in the last two years”
[Managing Director, Company E]

Lack of planning and preparation could also be seen in other areas of the firm. The company’s actions in regards to new service development show a lack of preparation and understanding of competition.

“Well it was because of specific technical capabilities. You know a group of companies in Vietnam that needed our help. So yeah it was completely opportunistic. We didn’t think ahead and plan it. We tried it to maintain it some period after that but it didn’t pan out very well. We didn’t make any money.”
[Managing Director, Company E]
Although the company has demonstrated poor planning and strategic decision making abilities, it has been able to leverage and exploit its investments in technological knowledge in novel ways.

“We tried it [GIS] for a while and it didn’t work out. It’s too competitive. People working out of their basements charging nothing, so we gave that up. However, we developed a neat tool that we used in other parts of our work including the 3D modeling aspect.” [Managing Director, Company E]

4.2.5.4 Evidence of changes in cognition and capabilities

In response to changing socioeconomic changes and customer taste profiles due to growing affluence, Firm E shifted its efforts to develop capabilities in designing SOHO (Small Office, Home Office) apartments. Firm E made changes to its product-market strategies by aggressively expanding into new markets seeking opportunities in Malaysia and Australia and broadened its product offerings. It also diversified its product offerings to include resorts, and health spas. The firm monitored their human resource requirements with respect to their strategic goal structures. It has sought over time to ensure that it has a high caliber management team relative to other firms of their size. In considering the acquisition of an Australian firm, recognized that this acquisition target not only provided it with enhanced access to the Australian market, but also an opportunity to bolster its design innovation capacity. The Australian firm had a strong reputation for new product development and had been recognized almost on an annual basis with new design awards.
The managing partner and one other partner had considerable experience in the European and Indian markets. As a result of their respective experiences, the managers were very comfortable pursuing market opportunities outside of Singapore in China and India relative to other firms of this size.

The managing partner had established aggressive growth objectives for his firms by aiming for project value of over $120 million by 2016. He had a strong competitive desire to win in the marketplace and make his mark on Singapore’s design industry. These managerial perceptions shaped the strategic goals of the firm. He constantly monitored trends in South-east Asian and China markets and indicated that U.S., U.K. and Australian firms are strong innovators and European design trends are good indicators of where the South-east Asian industry will be heading in future.

He took stock of options available to ensure that they were able to meet their growth objectives and they evaluated these options within the overall context of their strategy. He focused on growth through acquisition. In doing so, he considered the fit of the opportunity within the context of its overall strategy. For example, the opportunity to acquire a smaller design firm specializing in healthcare designs enabled it to expand its product offerings. In addition, the opportunity to acquire a Hong Kong-based firm enabled it to enter the market for retail and entertainment designs. He also considered the level of comfort of his partners before moving forward with an acquisition. If one was uncomfortable with pursuing a particular target firm, he would abandon the idea.
Company E is the most technology-oriented of all the case firms. The managing director focused on the importance of visualization technologies throughout all its projects.

The company’s practices for obtaining external knowledge and ideas are largely routinized in that all responsible people automatically followed the development of the competitors, and these practices were not formalized or supervised by managers.

“Good design ideas often stem from actively following other services. We think about how they have solved certain problems and come up with new ideas for our own services.” [Project Director at Company E]

The company’s capability assembly processes are embedded in a culture that encourages entrepreneurial efforts. Its sensing processes are informal. Managers are responsible for assessing new developments and identifying needs and developments that the company could turn into business, and employees were expected to keep track of trends, needs and competitor activities as part of their daily work routine.

“I guess what we are good at is having our “feelers out”. You see ideas and steal the ones you like and make them your own in a way.” [Project Director, Company E]
This illustrates the ongoing, yet informal and intuitive way of keeping up-to-date and acquiring knowledge from the external sources.

In the midst of the global financial crisis in 2008, the managing director was concerned about falling revenues and thus directed the managerial team embarked on sourcing new revenue streams, improve existing services based on client feedback and evaluated the business potential of new industry segments to expand into. The Managing Director made the decision to form a steering committee to secure more projects.

“We formed a separate team for bigger projects. They have their own evaluation process …”. [Project Director, Company E]

The Managing Director emphasizes several aspects, i.e., paying attention to new revenue structures and building client commitment through constant engagement. Nevertheless, capabilities in internal decision-making processes and building internal commitment to the new services remained weak.

“We have tried to implement old services in a new way – to streamline the project for the clients and there’ll be a lower workload for our staff.” [Project Director, Company E]

The company practices learning-by-doing which enables its business to be created as a result. In recent years, there had been a strong focus on securing
more revenue streams, which lowered the tolerance towards experimenting.
“Make mistakes, but make them quickly and learn from them” was the mantra.

Apart from taking the pressure to do as well both locally and internationally, the managerial team produced an increase in knowledge-transfer and all drafting activities were transferred to the Vietnam office.

“We liberated all the design teams from the financial yoke, but also reserved the right to develop their own designs.” [Project Director, Company E]
“I really wish that the design industry had influenced the way we work here, and react, and the speed at which we did it…. but it really has not.” [Marketing Director, Company E]

The company took concrete steps since 2009 to organize its development work and its internal knowledge management. It established a managerial team responsible for coordinating project development, sales and partnerships. The company formed inter-functional project teams and job rotation in order to foster communication and learning. Lessons learnt were shared in regular meetings, and an internal blog kept up with design and technical issues. It appeared to impact the internal atmosphere as well as outcomes: improvements and innovative solutions were developed.

“We invested in ICTs for all our operations in several countries. We have shared systems and a shared hosting service. The purpose of this is to enable internal
collaboration. We don’t have to do everything together but we have to keep in mind the possibility, so that we can benchmark and copy best practices internally”. [Project Director, Company E]

The Managing Director considered it important to be in or close to the technology frontier. To realize this, he established an R&D unit to support the technology needs of the company. The company developed extensive market research in order to identify new market niches and customer needs.

“We and some other companies have been quite late and bad at commercial thinking in our design initiatives. …For instance, we have been very bad at using web advertising to showcase our design capabilities”. [Marketing Director, Company E]

The company is often required either to develop new competencies internally or to absorb new knowledge from external sources.

The firm’s marketing strategy differentiates it from the competition – it is leveraged towards achieving its growth objectives. This firm’s unique approach to marketing consists of two elements; it sells value-added design and focuses on growth through acquisition and targets tend to be reputable small firms with complementary, as well as competing, design styles. However, the managing director had indicated that the firm is in need of a strong team with managerial skills to execute its strategy given its ambitious growth objectives.
The company has expanded its management team gradually over time to include managers with strong pedigrees. For example, the firm’s Director of Business Development and Marketing was once the Director of International Business Development of Singapore’s largest architectural firm, while the Chief Financial Officer was once a Vice President of Corporate Finance with one of Singapore’s “Big Three” bank. These managers did not join at the same time. The managing partners felt that the secret to attracting high caliber managers was to articulate an attractive future of the firm to prospective candidates.

The managing director has identified general management and marketing innovation as an area of strength. He made investments in tangible resources and encouraged managers to regularly attend trade shows and conventions as a means of accruing knowledge of industry trends to support its competence in marketing innovation.
Table 4E-1: Company C - Cognitive processes in assembly of capabilities

<table>
<thead>
<tr>
<th>Managerial cognition</th>
<th>Managerial choices and actions taken to assemble capabilities</th>
<th>Evidence of dynamic capability assembled</th>
</tr>
</thead>
</table>
| Cognition of capability purpose  
  - Identify purpose for which capabilities would be assembled  
  1. Problem cognition- Managers perceive organization shortcoming or gap in performance relative to strategic goals  
     - managerial learning about nature of the problem  
  2. Cognition of impact on firm capabilities | Managing director has strong cognition to succeed in the marketplace and make a mark on the industry  
  - strong desire to build a lasting company on his own and fast.  
  - desire for aggressive growth drove the firm to depend on mergers & acquisitions to expand rapidly  
  - focus on original core offerings | Managerial capability  
  - the firm continually grows its management team to execute its strategy given its ambitious growth objectives  
  - growth through mergers and acquisitions  
  Client relationships capability |
| Cognition of capability salience  
  - Understanding what the firm can do  
  1. Managerial knowledge of what the firm can do from previous experience in executing routines  
  2. How managers compare strengths of firm with the competition | - perceived to have superior managerial skills  
  - highly qualified managers with previous experience in acquiring and merging companies  
  - able to support targets by providing them access to capital to grow  
  - has expertise in finance and international marketing  
  Client-driven culture has enabled the firm to capture client’s attention and develop meaningful relationships with them |
Table 4E-2: Company E: Summary of learning and change triggered by operating environment

<table>
<thead>
<tr>
<th>Change triggered by external</th>
<th>Evidence from company of managerial choice and action</th>
<th>Demonstrated changes to operational capabilities, routines and resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification of dynamic capabilities</td>
<td>Cognitive ability to quickly act upon needs identified by its clients; new service development</td>
<td>Change to service production process Modification of physical resources</td>
</tr>
<tr>
<td></td>
<td>Utilize knowledge dissemination to attract and retain clients</td>
<td>Continual modification of firm’s knowledge base</td>
</tr>
<tr>
<td></td>
<td>Utilize strong network ties to attract and retain clients</td>
<td>Requires maintaining client relationships and networking</td>
</tr>
<tr>
<td></td>
<td>Opportunistic use of expertise and reputation to define clients’ future research needs</td>
<td>Impacts the firm’s network and requires maintaining strong client relationships</td>
</tr>
<tr>
<td></td>
<td>Opportunistic choice of foreign market based on network</td>
<td>Impacts the firm’s network and requires maintaining strong client relationships</td>
</tr>
<tr>
<td></td>
<td>Ad hoc investments in physical infrastructure</td>
<td>Impacts service production and delivery processes</td>
</tr>
<tr>
<td></td>
<td>Symbiotic development of experts’ individual core areas of knowledge; informal knowledge management</td>
<td>Impacts the firm’s service offering and service production processes</td>
</tr>
<tr>
<td></td>
<td>Increase in capacity for service production and delivery</td>
<td>Impacts firm’s ability to respond to client requests</td>
</tr>
<tr>
<td></td>
<td>Elimination of services</td>
<td>Impacts firm’s ability to respond to client requests</td>
</tr>
</tbody>
</table>
4.3 CROSS-CASE ANALYSIS

This section examines in all five cases the themes indicated as relevant in the literature review and emerging themes identified during the coding process. The cross-case analysis was completed using pattern-matching and explanation-building techniques to ensure the internal validity of the study’s findings.
<table>
<thead>
<tr>
<th></th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Company D</th>
<th>Company E</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of employees</td>
<td>50</td>
<td>65</td>
<td>55</td>
<td>95</td>
<td>74</td>
</tr>
<tr>
<td>Strategy type</td>
<td>Client relationships</td>
<td>Client relationships</td>
<td>Client relationships</td>
<td>Adapting solutions</td>
<td>Client relationships</td>
</tr>
<tr>
<td>Critical operating capabilities</td>
<td>Resource allocation, Project management, Sales and marketing</td>
<td>Service innovations, Project management, Sales and marketing, Marketing capabilities</td>
<td>Resource allocation, Project management, Sales and marketing, Talent recruitment</td>
<td>R&amp;D, Project management, Sales and marketing</td>
<td>Talent recruitment, Project management, R&amp;D</td>
</tr>
<tr>
<td>Critical resources</td>
<td>Technical knowledge and know-how, client network, Reputation</td>
<td>Managerial skills, Client network, Reputation</td>
<td>Social capital, Human resource, client network, Know-how</td>
<td>Client network, Corporate culture, Technical knowledge, Reputation</td>
<td>Managerial skills, Client network, Reputation</td>
</tr>
<tr>
<td>Founder background and company founding year</td>
<td>Family business started by managing partner’s father to provide consulting services for mass-market housing</td>
<td>Family business- Managing partner inherited company</td>
<td>Founder was frustrated at missed opportunity that his former employer ignored and founded company to capture this niche</td>
<td>Founder started firm when he won high-profile commission</td>
<td>Founder started company and built regional reputation on sustainability practice</td>
</tr>
<tr>
<td>Initial growth stage</td>
<td>Expanded into hospitality sector and lifestyle business</td>
<td>Initial focus on cutting edge, differentiated on private residential market</td>
<td>First ventured into under-served flexible housing market</td>
<td>Business idea to provide adaptive reuse expertise</td>
<td>Business idea to be first mover to build sustainability as core service</td>
</tr>
<tr>
<td>Initial organizational expansion</td>
<td>From 8 in 1987 to 30 in 2001</td>
<td>From 3 in 1990 to 28 in 2001</td>
<td>From 5 in 1999 to 12 in 2001</td>
<td>From 9 in 1998 to 20 in 2001</td>
<td>From 3 in 2000 to 12 in 2001</td>
</tr>
<tr>
<td>Implications of falling trade barriers and financial crisis</td>
<td>Falling revenue</td>
<td>Revenue down, staff cuts</td>
<td>Revenue down, Difficulty in local market</td>
<td>Revenue down, shrinking market share</td>
<td>Revenue flat</td>
</tr>
<tr>
<td>Reassembly and reorientation to growth</td>
<td>Reorientation to growth through a successful new service concept for developers</td>
<td>Divestments of 3D computer animation services, landscaping and interior decoration contract work to focus on design consulting services for high-end condominiums and hotels</td>
<td>Focus on learning environment and technologies to improve productivity. Developed employee relationships</td>
<td>Reorientation of the product offering of the firm and expand R&amp;D efforts</td>
<td>Focus on original core offerings growth through mergers and acquisition</td>
</tr>
<tr>
<td>Project value 2011 Employees 2011 Growth rate 2011 Markets</td>
<td>$60m 50 &gt;30% Domestic and foreign</td>
<td>$65m 65 &gt;25% Domestic and foreign</td>
<td>$70m 55 &gt;10% Domestic,</td>
<td>$100m 95 &gt;15% Domestic and foreign</td>
<td>$50m 74 30% Domestic and foreign</td>
</tr>
</tbody>
</table>
Table 4.3b: Cognitive processes in assembly of capabilities at the case firm

<table>
<thead>
<tr>
<th>Capability assembly</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Company D</th>
<th>Company E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Financial crisis and deregulation caused management team to be concerned about falling revenues. Cognitive shift to be more client-focused and need to assemble necessary routines -managerial concern with &quot;being spread too thin&quot; -Managerial cognition that maintaining relationships with clients are crucial to secure more work</td>
<td>Pessimism about viability of local industry once FTAs came into effect. Cognition shifted to divest non-core businesses to focus on higher value-added consulting -cognition that existing business activities were being too broad -cognition of opportunity to enter China market -need to assemble capability to develop Western-styled, modern designs for China market -skills needed to target high end clients and penetrate from relationship point-of-view - clients are important to access new markets and develop marketing and technical knowledge</td>
<td>Financial crisis and deregulation caused managing partner and managerial team to be concerned about shrinking work opportunities. Cognition shifted to expanding to emerging markets since local market was stagnant -concerned about productivity and cognition of need to upgrade staff skills to compete. -managing partner’s cognition about how relationships with employees are managed -Managing partner’s cognition of need to involve in community activities to nurture learning environment</td>
<td>Founder worried about long term prospects due to deregulations -He is committed to health and environment issues -focused on sustainability leadership and devoted resources for this cause -cognition shift to re-conceptualize product offerings and expand R&amp;D efforts.</td>
<td>Managing director’s cognition to succeed in the marketplace and make a mark on the industry - desire to build a lasting company on his own -desire for aggressive growth drove the firm to depend on mergers &amp; acquisitions to expand rapidly to fulfill founder’s vision - decided to focus on original core offerings -cognitive shift to focus more on client needs</td>
</tr>
<tr>
<td></td>
<td>-capability to leverage cultural diversity of team, deploy employees with empathy to values of target markets for international projects</td>
<td>Managerial cognition of Singapore’s management systems as more readily transferable to China markets Capability to adapt Western hotel standards</td>
<td>Managing partner constantly reviewed staff performance to ensure fit. -cognizant of insufficient qualified personnel in key managerial positions</td>
<td>-the firm has built up a strong database of detailed client information -extensive links with universities and research councils -strength in securing research grants</td>
<td>-perceived the firm possessed superior managerial skills - highly qualified managers with previous experience in M&amp;A -able to</td>
</tr>
</tbody>
</table>
| Experience in executing routines | -strong client-driven culture – history of listening to clients  
- strength in networking and furthering relationships with key clients | to Chinese markets  
-perceived partnering as least risky strategy to penetrate Chinese markets.  
-Ability to orchestrate activities with partnering firms | Action to recruit talent to assemble capability  
Company’s skills at human resource programs  
- Mentoring and reward systems  
- Ensure staff fit and alignment cognition  
- create learning environment  
- investments in technologies to support firm operations | from government agencies  
- large R&D team (eight doctoral/masters level researchers)  
- has built up strong reputation  
- expertise in environmental sustainability | Support targets by providing them access to capital to grow  
- has expertise in finance and international marketing  
Recognized client-driven culture as important to capture client’s attention and develop meaningful relationships |
| --- | --- | --- | --- | --- | --- |
| 2. How managers compare/benchmark strengths of firm against the competition | Evidence of capability assembled | Client relationship capability  
- continually built client-driven activities  
- nurtured long-term relationships with clients at all levels  
- constantly engaged with clients on projects and address client needs  
- Service (design) innovation capability  
Developed new service offerings requiring specialized expert knowledge  
- focus on generating new solutions to suit client needs  
- build specialized technical team to support this capability | Employee relationship  
- employees constantly generate creative solutions  
- maximize efficiencies and contain costs  
- staff are motivated and turnover is low  
| Marketing capability  
- successful in marketing the adoption of its designs abroad  
- Aggressively sell its innovative mid-range design alternatives for markets in China  
| Service (technical) innovation capability  
- used technical know-how to expand its range of designs for alternative health lifestyles  
- continual investments in R&D activities | Managerial capability  
- the firm continually grows its managerial team to execute its growth through mergers and acquisitions  
Client relationships capability  
Continually invested on network of contacts |
4.3.1 Managerial cognition, learning and knowledge accrual

The study’s research objective strived to assess the impact of environmental change on managerial cognition, knowledge accrual and the assembly and/or modifications of capabilities in Singapore’s design firm operating in a changing environment. The literature review uncovered several themes pertinent to this research question, notably the managerial cognitive process, knowledge accrual, and sources of knowledge accrual. These themes are further discussed below.

4.3.1.1 Sources of knowledge accrual in design firms

The case firms had all experienced difficulties in their home market, brought about by the financial crisis and deregulations of the local market. This is consistent with the literature which argues that companies increasingly seek out foreign markets in response to growth limits in the home market (McNaughton, 2003), liberalization and competition (Oviatt & McDougall, 1995; Bell, 1995).

Company D and E penetrated foreign markets to accrue market knowledge through the completion of projects in these markets. They continually innovated on their service offerings to build their reputation. There was no evidence to suggest that both companies had developed the necessary capability to disseminate knowledge within the companies. Company D demonstrated successful knowledge accrual followed by inconsistent knowledge dissemination within the firm.
“I guess that’s how we have always worked, we respond and we react to opportunities. The cycle is the same, we get really busy, we deliver, we run out of jobs and then we do it all over again so we come up with a new way of doing it.”
Managing Partner, Company D

In Company A, the absence of this capability may partly be explained by its organizational structure which relied heavily upon personal networks to contract some of its expertise. Thus, given that employees may not necessarily maintain consistent communication channels, the process by which knowledge is absorbed and interpreted at the individual level and becomes integrated and shared at the team level may not exist. In the case of Company C, due to the capital intensity of its services, the company had expanded into foreign markets as a means to exploit its past investments in its knowledge base and intangible assets and as a mature firm, it would already have established deeply rooted routines that would require major unlearning and relearning in order to absorb knowledge (Autio et al., 2000)

The accrual of knowledge and cognitive learning were observed in all companies; all interviewees suggested that both capabilities were essential to the survival of firms. All companies demonstrated evidence of cognitive learning through the use of their networks relationships and interactions with network ties as a means of acquiring experiential knowledge (Yli-Renko et al., 2002; Chetty & Campbell-Hunt, 2004). The prevalent use of networks, particularly the managing partners’
contacts to gain market knowledge suggests that firms mitigated resource constraints by using external sources of knowledge. Company C deployed its network relationships during the early phases of foreign expansion to gain market and international knowledge. The importance of all cases’ networks may be explained in part by their age. As these firms were all well-established, it is not unreasonable to assume that managing partners and managerial teams had spent considerable time building upon their networks and contacts.

In all cases, the knowledge accrued and integrated into their resource base deeply influenced their managerial cognition and resource allocation decisions, as managers further dedicated their firms to seek out external growth. Case D, however, modified its decision making process over time to proactively seeking out international projects following the experiential knowledge it accrued.

“We did all of that research and raised our profile because our work was much more detailed and at the time there were a number of leading companies based in Singapore and that had us getting requests. We’ve always prided ourselves on the quality, the depth and the rigor of our work. If you’re operating internationally, that adds a whole other dimension to that and I would say that would be a deliberate limiting factor for us.” [Managing Partner, Company C]

Company C continued to make significant investments in the foreign markets in which it had initially won some bids. Although the firm had accumulated
knowledge on markets it had targeted but had yet to penetrate, the successful bid for projects preceded the setting up of a foreign office in its targeted markets.

“It’s not getting the first, but are we doing the things to create a rapid succession of the next five” [Managing Partner, Company D]

All managing partners had previously acquired knowledge in the form of previous work experiences abroad (Cohen & Levinthal, 1990; Sapienza et al., 2006; Westhead et al., 2001). Case D demonstrated a need to modify its operational processes based on the experiential knowledge it gained from managing difficult projects with some partners that necessitated the coordination of activities between both domestic and international companies. However, these cultural issues were not detrimental to the service’s production or delivery.

“The Singaporean companies are quicker at getting approvals and being able to gather information and speak to people. The international ones take a lot longer which affect delivery schedule..”[Project manager, Company D]

4.3.1.2 Change in managerial cognition and the design firms’ resource base

The data indicated that reaction of Company A to the threat from the deregulations and financial crisis was its managers’ increasing emphasis on maintaining relationships with clients to secure more work and expand its service innovations. Company B’s management shifted their emphasis increasingly to focus on external growth in China and to divest non-core activities as it felt that its
existing business activities were too broad. It paid more attention to client relationships. Company C’s managing partner felt the need to involve more in community activities and nurture a learning environment within the firm. Company D’s managing partner’s cognition caused a shift to reassemble the firm’s product offering on sustainability leadership and devoted more resources to research and development efforts. Company E’s managing partner cognitive shift changed the firm’s focus on large corporate client while also keeping its original design focus. The above evidence indicates the changing managerial cognition over time.

The cross case analysis provided insights on how the case firms' cognition changed in response to environmental change and how these changes led to modifications in their operational capabilities and why the companies made the strategic choices they did in response to environmental challenges.

“We discussed our options - whether to focus on our existing client base or to focus on our largest clients and become a dedicated consultant for them. We were most comfortable with the second option since our best and most profitable experiences came from the larger clients in the hotel and retail sectors.”
[Managing Partner, Company B]

Evidence from study suggests that the firms' strategic choices reflected the cognitive frame, preferences and dominance of the managing partners. For instance, three of the managing partners had prior experience in the hospitality sector which may explain their interest and relative ease working on these project
types. Company B’s new reorientation of its design focus may also be related to the fact that two of the three senior managers had prior experience in foreign markets and were comfortable shifting the firm’s focus to international activities.

4.3.1.3 Managerial cognition, prior experience and networks.

The evidence from the cross-case analysis indicates that the formation of managerial cognition of the firm is impacted by the individual character and background of the managing directors/partners. For example, the interest in the applicability of technology to solve business problems compelled the managing partner of Company A to invest heavily in sophisticated rapidography technologies which he felt would support visualization of design products and result in quicker sales to clients. The technological interest of the managing partner drove the managerial cognition to focus on “technical service innovation” ever since the firm was founded. Client demand and intense competition cause the managing partner of Company D to place stronger emphasis on the quality of the firm’s designs to differentiate from other competitors. The global financial crisis of 2008 had taken a toll on the firm and as the local market shrank, he had to look to external markets for growth. The entry of MNCs and the consolidation of the larger Singaporean firms caused managerial cognition at Firm C to shift from the focus on the local markets to finding new growth markets elsewhere. The competition in the design industry was increasingly intense due to entry of large foreign firms eroded the local firm profits and threatened the survival of the smaller firm due to the small market in Singapore. Thus the characteristic of the competitive environments impact the managerial cognition of managers. Forces causing a cognition change
include manpower cost increases due to tightening of foreign labor, increasing client focus on quality, brand, service and function and trade liberalization. At Company E, this caused a cognitive shift from a focus on profitability to strategic focus on delivering environmentally sustainable products. Different cognition also led to varying strategic behavior among the case firms. Thus, the cognitive antecedents to dynamic capabilities depend on managers' prior experience and their knowledge of their firm’s resources, assets, contacts, and relationships. As Teece (2007) notes, leadership and culture are important micro-foundations of dynamic capabilities. The findings here demonstrate the importance of these constructs and how they are driven by managerial cognition.

The managing partner at Company A explains cognitive change at the firm as follows:

“It was important to help the team to get beyond the current reality to see opportunities that we wouldn't otherwise see because of the mind sets that we're constrained by. Changing our mind sets does help drive results…” Company A, Managing Partner.

This cognitive shift enabled the firm to reassemble capabilities to change organizational processes and leverage the firm’s knowledge base toward different markets. The managing partner explained the importance developing the capability to reshape the firm.
“When our designers are working on Singapore projects, they are naturally aligned with the rule and idiosyncrasies here but for emerging markets the parameters are just so different. The biggest challenge is always how we reshape the firm, to redirect our people into other areas they are less familiar with in order to win the jobs” – Company A, Managing Partner

At the case firms, projects provide opportunities for learning (Acha, et al., 2005). Managers learn from this experience and convert past events into knowledge for future use (e.g., March, Sproull, & Tamuz, 1991). The strategy literature suggests that prior experience forms the basis of organizational capabilities (Helfat & Lieberman, 2002) that can be leveraged in new sets of activities (such as entry into new markets) (Eggers, 2012a; Holbrook, Cohen, Hounshell, & Klepper, 2000; King & Tucci, 2002; Klepper & Simons, 2000). The case evidence suggests that firms cognitively learn from projects and this activity is strategic in nature which feeds into the company’s knowledge base for future use. For example, Case D used a one-off project to learn about partnering in a joint venture in China. The learning in that project enabled the firm to progressively undertake larger projects in the foreign market which required alliancing experience and capability. This experience eventually led to new business opportunities for the firm.

“We were lucky to win a JV project that our competitors weren’t interested in… this job was small but we had a steep learning curve and we parlayed that into bigger projects in China eventually” Managing Partner, Company D
Firms accrue knowledge from past experience, use it to improve current knowledge stocks and reconfigure this knowledge to meet changing environmental demands. The case evidence suggests that firms learn from their networks which expanded their knowledge base. For instance, the managing partner of Case A built new knowledge using personal networks and contacts and this capability is critical to acquire new work opportunities. The process involves identifying important project and building relationships with the clients much before the project is formally initiated. As the Managing Partner of Case A relates:

“We identify new projects by talking to our network of contacts through our marketing team. We also rely on people working on projects and by talking to the staff from the client side to know what’s happening.” Managing Partner, Company A

Firms strategically accrue knowledge from their networks and external linkages, use this knowledge to improve their current knowledge base and modify or reconfigure this knowledge to meet changing environmental opportunities.

4.3.2 Learning and cognition of strategic opportunity

All five cases demonstrated that the founders or managing partners/directors were the key agents of change in the firms. Their recognition of opportunities and their corroborating actions once they sensed these opportunities paralleled the process of absorbing new knowledge into the firm, demonstrating organizational learning prior to change (Crossan et al., 1999; Dutta & Crossan, 2005). However,
it is impossible to assess whether the key agents in the firms understood and then acted or acted and then interpreted because data was collected during in-depth retrospective interviews rather than by longitudinal observation.

For example, Company C recognized the opportunity to diversify into foreign markets as it continued to encounter difficulty to expand in its domestic market. After integrating this knowledge and articulating this learning to the management team, the Managing Partner suggested targeting emerging foreign markets in a way that would give the firm room to fail prior to succeeding in international markets.

“On that basis we said ‘Let's pick a few markets which are not aligned tightly, so that if we’re wrong in India, we won’t have any bleed over effect in Vietnam. And if we’re wrong in Vietnam, it won’t bleed into China’.”[Managing Partner, Company D]

Company D developed managerial cognition of an opportunity in the market as it had vicariously learned from the success of the US and UK firms researching and applying sustainability practices. The firm recognized the opportunity to focus the research on the Singaporean market. Learning led to subsequent change in the firm, as it invested resources to develop new knowledge and enhance its expertise.
“We saw how the LEED and BREEAM sustainability certifications can be adapted and applied to Singapore. So we did all of that research which raised our profile, because our research was much more detailed and the MNCs gave us many requests”. [Managing Partner, Company D]

Company A had also developed the cognition to the strategic opportunity in the market through advancements in technology that enabled it to develop a complementary product to its services.

“The 3D technology has really moved fast and we saw how it would help jumpstart or graphics business, it just flew” [Managing Partner, Company A]

Strategic action subsequent to managerial cognition of the opportunity and the accrual of new knowledge resulted in change in all five firms. Change was often not planned or patterned. In their strategic actions and discovery process, managers did not adhere to any particular capability. The sequence of opportunity cognition and subsequent strategic action may be explained through the processes of organizational learning, as suggested earlier. Following the study’s parameters, the process of cognition of strategic opportunity may be defined as second-order capabilities. These findings are consistent with the theoretical work of opportunity recognition by Dutta & Crossan (2005). Managers’ previously knowledge through past work and experience suggest that firms had developed absorptive capacity (Cohen & Levinthal, 1990) that enabled them to identify opportunities (Shane, 2003). Managerial actions
subsequent to cognition of strategic opportunities led to the assembly and/or modification of change processes, as defined by dynamic capabilities. Knowledge accrual and learning was found to be particularly important in the case firms as it allowed the firms to continuously learn from their value-creating processes. Along with the firm’s ability to learn, these processes are defined in the literature as cognition of client need and subsequent sale of a service to meet the client need, followed by service delivery activities to achieve project completion.

Table 4.3c: Triggered Change in Value-Creating Processes at the case companies

<table>
<thead>
<tr>
<th>Value creating processes</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Company D</th>
<th>Company E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition of client need, subsequent sale of service</td>
<td>Innovation to core service: dynamic capability Sales and marketing: Strategic decision making from prior experience</td>
<td>Innovation to core service: dynamic capability Sales and marketing: dynamic capability</td>
<td>Innovation to core service: Strategic decision making from prior experience Sales and marketing: dynamic capability</td>
<td>Innovation to core service: dynamic capability Sales and marketing: decision making from prior experience</td>
<td>Innovation to core service: dynamic capability Sales and marketing: Strategic decision making from prior experience</td>
</tr>
<tr>
<td>Service delivery activities to achieve project completion</td>
<td>Problem solving through prior experience Performance evaluation</td>
<td>Knowledge management Dynamic capability</td>
<td>Knowledge management Dynamic capability</td>
<td>Knowledge management Performance evaluation</td>
<td>Problem solving from prior experience</td>
</tr>
</tbody>
</table>
All companies invested in the implementation of change processes. However, managers often improvised on strategic actions based on the firm’s accrued knowledge without having established the necessary change processes. Thus, dynamic capabilities were examined by observing instances in the firms where their operational capabilities had been systematically changed through routines. Strategic decision making from prior experience were observed in instances where change had not been routinized or repetitive.

4.3.3 Managerial cognition, learning and change through dynamic capabilities at the case firms

Dynamic capabilities are the firm’s routinized processes responsible for its ability to “create, modify or reconfigure” its resource base (Easterby-Smith et al., 2009). Their implementation often has strategic outcomes, as dynamic capabilities are responsible for the change processes that enable firms to remain competitive by renewing the resource and capability combinations on which their competitive advantage is founded.
Table 4.3d: Change in the case firms triggered by dynamic capabilities

<table>
<thead>
<tr>
<th>Areas of organizational change</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Company D</th>
<th>Company E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service innovation</td>
<td>Service innovation</td>
<td>New service development</td>
<td>Revenue model</td>
<td>New service development</td>
<td>Knowledge dissemination</td>
</tr>
<tr>
<td>Foreign expansion</td>
<td>Foreign expansion</td>
<td>Service innovation</td>
<td>Sales and marketing</td>
<td>Service innovation</td>
<td>Service innovation</td>
</tr>
<tr>
<td>Performance evaluation</td>
<td>Performance evaluation</td>
<td>Knowledge dissemination</td>
<td>Foreign expansion</td>
<td>Knowledge management</td>
<td>New service development</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Project financing</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Changes to operational capabilities</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Company D</th>
<th>Company E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service production process</td>
<td>Service production process</td>
<td>Service production process</td>
<td>Resource allocation process</td>
<td>Service production process</td>
<td>Service production process</td>
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<td>Sales and marketing process</td>
<td>Sales and marketing process</td>
<td>Service delivery process</td>
<td>Service production process</td>
<td>Service delivery process</td>
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<td></td>
<td>Recruitment and hiring</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Changes to routines and resources</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Company D</th>
<th>Company E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial resources</td>
<td>Financial resources</td>
<td>Physical resources</td>
<td>Financial resources</td>
<td>Knowledge base</td>
<td>Physical resources</td>
</tr>
<tr>
<td>Physical resources</td>
<td>Physical resources</td>
<td>Knowledge assets</td>
<td>Knowledge assets</td>
<td>Knowledge information systems</td>
<td>Knowledge assets</td>
</tr>
<tr>
<td>Network ties</td>
<td>Network ties</td>
<td>Founder’s Network</td>
<td>Clients</td>
<td>Clients</td>
<td>Contracts</td>
</tr>
</tbody>
</table>

4.3.3.1 Similarities and differences in the assembly of dynamic capabilities

All the cases studies demonstrated evidence of having assembled dynamic capabilities; however, the change objectives of these processes differed between cases. Some dynamic capabilities were assembled in multiple cases, while others only presented evidence in a single case.

For example, Companies A, B, D and E assembled dynamic capabilities for new service development and service (technical/design) innovation. Companies A and
C assembled dynamic capabilities pertaining to foreign market penetration activities. Companies A and D provided evidence of systematic change in their strategy as a result of performance evaluation processes. Knowledge management processes were developed in Companies C and D. This may reflect the need for more structured and formalized knowledge sharing processes as companies increase in size. Companies A, B, E assembled dynamic capabilities in client relationships. Only Case C assembled an initial dynamic capability to ensure the financing of its projects and modification of its revenue model. This can be explained by the fact that it is the only service provider which may be described as capital-intensive. Additionally, Company C was the only company which assembled dynamic capabilities in employee relationships. This may be attributed to the managing partner’s cognition of the importance of a caring and learning organizational culture.

The case firms assembled routine and resources as needed for different projects, which is important for the timely completion of projects. For example, Company B created new work opportunities by putting together a team that drew upon its resource base to address project requirements and bid for new work. As the Managing Partner of Case B explained:

“We can put a bid together on the fly in two weeks. We draw on our sub-consultants when needed, which would give our team an edge. For example, we will get the best hotel interior designer and ad agency from Singapore for a particular pitch and within a week, we’ll get them to give us their quality
statements and submit a quick concept and then we’d find out within another week whether we’re successful or not. If not we move on to the next pitch. We just have to be this fast these days” [Managing Partner, Company B]

Company D gained new knowledge from learning to formulate new ways of overcoming the problems they encountered in their service delivery. With the lessons they learnt from the previous projects, they moved into backward integration i.e., they created their own capacity to develop prototypes in-house and they formed new forms of partnerships. As projects by nature are usually one-off by nature, knowledge gained from one project can be usefully transferred to other projects. Blazevic et al. (2003, p. 130) provide evidence of this form of learning: “project teams retrieve past knowledge from previous projects that could be used and applied to the respective innovation project”.

On the other hand, Company E combines in-sourcing and outsourcing to ensure new and efficient project outcomes. These forms of new value creation reflect the competitiveness of the firm as a consequence of a reassembly of its capabilities.

As the Managing Partner emphasized:
“We really work hard to create a culture of innovation because it’s actually one of the ways we get judged by the client and it determines whether he selects us or not for his project.”
Company E attributes its performance attributes to its assembly of dynamic capabilities:

“I think the difference between us our competitors is greater is in areas where we have developed niche capabilities in areas such as environmentally sustainable design. Everyone is just trying to position themselves to they have got some kind of unique service that they can perform.” [Managing Partner Company E]

Thus, the differences between the cases are in their particular cognition and investment choice in dynamic capabilities. Managerial cognition and the learning process resulted in dynamic capabilities and modification of operational capabilities. Despite these differences, an underlying similarity between all cases was that managerial cognition and learning processes resulted in the assembly and/or modification of dynamic capabilities and the learning processes resulted in the subsequent modification and change of operational capabilities. This theme is further explored in the next section.

4.3.3.2 Implications of managerial cognitive processes on change triggered by dynamic capabilities

Evidence from the in-depth interviews suggests that the dynamic capabilities created in the firms studied came from managerial cognition of the need for change and acting upon this learning, or from creating change processes and learning from the results. This is consistent with the assertions of Kaplan and Eggers (2013) and Crossan et al. (1999). Where dynamic capabilities are
routinized and planned, they require maintenance and continued repetitive action (Zollo & Winter, 2002). The modification and change of dynamic capabilities also demonstrated cognitive-driven learning process, as firms acquired new knowledge and modified its change routines.

The following illustrates how cognition regarding managerial ability is ingrained in Company B in order to help shape the future of the firm.

“We always try to repeat the same approach that has worked for us in the past and we try to disseminate the learning to the teams and say that if they try the same approach, it can really help accelerate our progress. Sometimes it’s not about creating new things but about applying some of the managerial processes that has worked in the past.” [Company B, Managing Partner]

Company C has created a replicable process to establish its foreign presence based on the cognition that it required as a legal entity in the markets in which it would bid for projects. The learning process by which it recognized this need and implemented the process exhibits previous learning that had been absorbed into its knowledge base to support future strategic decisions.

“Yeah, I think that in every country you have to create a legal entity which is —, if you’re going to try to do a systemic thing, you have to have the ability to contract, which means you have to set up everything ” [Managing Partner, Case C]
Dynamic capabilities were observed in the firms by identifying strategic changes made to their operational capabilities. Evidence of dynamic capabilities in the study suggest that the companies invested in change routines after having absorbed and adapted new knowledge. In many cases, the dynamic capabilities in which the companies invested enabled them to exploit their existing knowledge base via the assembly or modification of their operational capabilities. This was also true of dynamic capabilities for the development of new services and for those that change the firms’ core service offerings. The case data suggests that the deployment of a dynamic capability resulted in subsequent changes to the firm’s operational process, often in their service production and delivery processes, through feedback learning as articulated in the conceptual model. Knowledge that had been integrated into the firm’s knowledge base to create or modify the dynamic capability was then subsequently exploited to modify the firms’ operational capabilities.

For example, Case E demonstrated a dynamic capability for rapid service development. This dynamic capability resulted from a learning capability where the managing partner absorbed and interpreted new knowledge as defined by the recognition of client needs. By integrating this knowledge into the firm’s knowledge base, the managers modified the firm’s operational capabilities as defined by service production and delivery processes, to reflect the firm’s learning. In so doing, they deployed the firm’s dynamic capability in rapid service development and exploited the firm’s knowledge base.
“We developed the capability to produce rapid 3D scale prototyping. We’ve done a number of projects and we could develop skills in design areas we have never done before. The capability to do all sorts of different things is need-based. We have to do it.” [Managing Partner, Company E]

In the case of Company A, its dynamic capability for service innovation resulted from cognitive learning processes where the management team absorbed new knowledge in the form of maturation of environmental sustainability markets. By integrating this knowledge into the firm’s cognitive knowledge base, the management team modified the firm’s operational capabilities, i.e. auditing service production and delivery processes to reflect the firm’s cognitive learning. In so doing, the firm deployed its dynamic capability for service innovation and exploited the firm’s knowledge, thus engaging in a feedback learning process.

“The environmental sustainability issue was a big thing in the early 2000s. Many firms now provide the service so we try to pitch at a higher level. We focus more on sustainability audit programs now. We provide strategic advice to the clients’ sustainability teams themselves. We’ve kind of gone up the value chain on that.” [Managing Partner, Company D]

Dynamic capabilities are costly to implement and maintain as they require consistent investments and continual usage. This often makes them inefficient and costly in many operational areas of the firm that do not necessitate
systematic change. Indeed, not all changes in design firms come from dynamic capabilities. Alternatively, these firms often demonstrate their capability for flexible and rapid decision making.

4.3.4 The capability assembly process - capability purpose and capability salience

Evidence from the in-depth interviews suggests that when faced with a particular opportunity or threat, managers intuitively sought to understand their organizations’ capabilities - both existing and potential, to ascertain the appropriateness of routines that may be assembled into the necessary capability. In all cases, cognition of salience of the particular capability came from the founder or managing partner, even while other managers may not be in total agreement with that cognition. Managerial action in relation to the creation of routines were largely driven by the cognition of the founder or managing partner. This managerial awareness shaped how the case firms pursued new opportunities and determined how routines were assembled into capabilities and cognition of the potential value of those capabilities (Danneels, 2011; Kaplan and Eggers (2013)

4.3.4.1 Similarities and differences in managerial cognition and capability assembly processes

The five case firms were established firms that had been operating for some time in the design industry. They had implemented operational capabilities that enabled their firms to deliver services in a way that ensured that they could continue to do
so. Company C’s problem cognition of its difficulties to grow in the local market caused a cognitive shift in its capability purpose to reconfigure its strategy and thereafter assemble the necessary capabilities in the hope of finding success elsewhere. The firm’s assembly of new dynamic capabilities to fit this cognitive change may be an indicator of its need to formalize its change processes, as it had undergone significant changes in its strategy in recent years. The prior experience of the managing partner was instrumental to the process of change in its operational capabilities.

Where Case C’s cognitive change resulted in the assembly of dynamic capabilities relating to its foreign expansion, the other firms exhibited signs of cognition of capability purpose as well.

“The nature of our business could be grafted anywhere in the world. Before you got here, I’m dealing with a client in Shanghai who wants to build a clubhouse. I’ve been to Shanghai and done several projects down there. But this is new. Last month I had one from Vietnam; as I mentioned the one from Bali that I turned down, but you know they come from all over the place. It really made me realized that we needed to adapt and change our skills to win in all these markets” [Managing Partner, Company E]

Although expert knowledge was identified as critical to the firm, Company D sought to extend it by assembling more diverse experts from outside the firm in
order to develop new service offerings as a result of this cognition of the new opportunity.

“We recruited an expert from the UK and brought him to Singapore to expand our hospitality practice which we see as a real growth opportunity for us. He did have strong networks with operators in Europe which was great for us– it’s an area that we really want to grow on and buying this expertise will really shorten our learning process.” [Managing Partner, Case D]

Company A, E, and D had often won new or recurring business through their networks and personal ties and indicated that their clients were their most valuable resources.

“In 2008 because of that relationship, I was asked to contribute to an environment facility project in Vietnam, where they were looking at adaptive reuse of an abandoned military site in Ho Chi Minh. The Singapore government was contributing to the reconstruction efforts and this conversation was there and they knew about this project and there was an opportunity to provide Singaporean expertise although we needed to rework our team skill to suit the local context.” [Managing Partner, Company D]

However, none of the managers cognitively felt the need to invest in codified processes to maintain and build client relationships, but took actions as and when necessary to satisfy their client needs. Examples of this include investments
in physical infrastructure (Companies E and D) and outsourcing of expert knowledge (Companies A and D).

“I think that we also learned that having 3D printing capabilities associated with those types of design work gave us an edge. We have built up these capabilities over the last couple of years as a result of that project and other ones. But it’s really hard to know what lies ahead. So I guess, we just kind of react to these gaps” [Design Director, Company D]

“There is this research fund from the Singapore Economic Development Board. It wasn’t so much a big moment thing, but when we began to realize how we could grow with that and we built our sustainable design capability this way.”[Managing Partner, Company E]

The case firms recognized that their reputations were also often the source of new or repeat business. They further asserted that their sales and marketing processes helped to expand their reputation and recognition as experts in the field. In comparison to the competitors, Company C had established formalized operational capabilities and exhibited dynamic capabilities relating to its foreign expansion. However, it was unable to capture further opportunities in its target markets. Having significantly invested in foreign subsidiaries in the countries in which it had completed its initial projects, the company had still been unable to build on these projects to grow in these markets as a means to leverage the initial investments it had made. Although the managing partner of
the firm recognized the opportunity, the company had yet to take further action.

“It’s like, that’s the cream on it. And so the big risk for our business going forward isn’t whether you have projects in China? It’s not getting the first, but whether you are doing the right thing to create a rapid succession of the next five.” [Managing Partner, Company D]

A possible explanation for Company C’s inability to grow in its target markets is its resource limitations. The managing partner did recognize the need to either partner or procure more investments to build the necessary capabilities and its actions had yet to be defined at the point of this study.

“If this initiative is going to get funding and support, it will need to come from the markets that are buying our designs. So it’s much easier and I don’t have to spend a minute explaining the absence of infrastructure to anyone who has lived or has been to China.” [Managing Partner, Company C]

4.3.4.2 Implications of cognitive learning process on firms’ capability assembly processes

All companies demonstrated evidence of cognitive change processes in response to environmental demands. These changes were manifested in their service delivery and service production processes. The explanations above exemplify situations where companies developed cognition of capability purpose and
capability salience in response to changes in the environments, perceived problems in their organizational processes and/or realized opportunities and attempted to assemble capabilities to respond to this new knowledge. Firms used their existing knowledge and resources to act upon these opportunities, which enabled them to exploit their firms’ existing resource base.

The initial evidence from the case studies suggest that the capability assembly processes brought about by cognitive changes in managers are change mechanisms that enabled firms to reorient its cognition to the capability purpose and capability salience necessary to act on the new knowledge and learning to impact the firms’ core value-creating processes. Ultimately, these strategic decisions had repercussions on the firms’ longer term horizons. The cognitive capability assembly process modified the firms’ operational capabilities and resources. The firms’ ability to take these actions may explain their ability to remain agile in their dynamic environments without the need for heavy investments in knowledge search dynamic capabilities.

Thus, the findings suggest that appropriate changes in managerial cognition from prior experience that facilitate rapid strategic decision-making act as a precursor to the assembly of dynamic capabilities. Recent research have articulated this cognition as a dynamic managerial capability that firms should develop to support firm agility (Eggers & Kaplan, 2013) The findings also suggest that the pattern of actions and the timeline in which the actions are observed may provide deeper insights as to how dynamic capabilities may be assembled in service firms.
Managerial actions demonstrated instances where the managing partner or managerial teams had absorbed new knowledge into their cognitive model, learned, and inherently recognized and acted upon an organizational shortcoming or strategic opportunity. Company C’s managing partner, in explaining the firm’s implementation of its expansion strategy, highlights evidence of cognitive change and subsequent managerial actions in the early stages of the firm’s strategy implementation process that were later transformed into highly patterned dynamic capabilities. For example, the firm used its first foreign expansion to test its operational capability in accruing market knowledge while determining whether the new operational capability could be sustained in similar future decisions. Upon entering foreign markets, it developed both cognitive purpose and capability salience to assemble specialized human resources that would be able to communicate with clients in these markets, requiring particular language and cultural skills to interface in the new environments. This cognition enabled the managing partner to reconfigure the firm’s design team. Taken alone, these instances of opportunity cognition and managerial action led to rapid decision making and assembly of a dynamic capability to support the firm’s foreign expansion activities, which it was continuing to sustain at the time of the study (Zahra et al., 2006).

“One of the things that we did intentionally on this was to go to each market and win the first project and understand the regulatory framework and their designs standards. We learned through that process what the workable solution is. When
that happens, the people who gather around as you are moving up the value chain become the people you want to bring into the company to run it.” [Managing Partner, Case C]

The findings suggest that repetitive and iterative cognitive process by managers may lead to the assembly of a dynamic capability and is consistent with the assertions of Helfat and Peteraf (2003) and Eggers & Kaplan (2013). Following Winter (2003) and Winter and Helfat (2011), the findings suggest that some of the dynamic capabilities observed in the firms came from an iterative process in strategic decision making. For example, Company E’s ability to quickly recognize client needs and build new products and services may have been non-patterned behavior at first. The managers did not plan ahead for service improvements or the development of new services; instead they simply developed the cognitive need from previous experience and acted on them.

“It was due to specific technical capabilities- a group of companies that needed a system for modeling how the new and old environments would gel in the Vietnam adaptive reuse project. We realized that we needed this 3D parametric component so we just went ahead and developed it. It was just opportunistic. We didn’t think ahead or planned for it.”[Managing Partner, Company E]

This cognitive and iterative process of modifying existing routines to perform new tasks to suit organizational needs eventually resulted in the assembly of a new dynamic capability – its ability to rapidly respond to its clients’ needs. Similarly,
Company A's cognition of new certification need led the managing partner to invest in the company's documentation processes to meet the certification code's standards. The internal processes were modified to incorporate a new organizational management system. By building these change processes and iteratively making improvements to its documentation standards, the firm eventually assembled a dynamic capability through which it distinguished itself from competitors in its target markets.

Consequently, based on the findings, the current study suggests that iterative cognitive processes in managerial decisions and managerial cognition of capability purpose and capability salience in response to similar opportunities (e.g., Company A, C and E) are antecedents that lead to the assembly of a dynamic capability when these cognitive actions persist over a longer period of time. The resource base renewal and capability assembly process of the case firms are different, reflecting the prior experience, strategic choices and cognition of each company. These assembly processes were triggered by strategic decisions based on the cognitive framing by managers in how capabilities are assembled in response to environmental change. In the absence of codified processes, the capability assembly process is largely characterized by learning-by-doing and learning from prior experience which were contextual and driven by firm-specific and situational factors (Gavetti and Levinthal, 2000 and Levinthal and March, 1993). All cases have long histories within the design industry in Singapore. The finding suggests that a prerequisite for a firm to survive in the design industry is the cognitive understanding of purpose and salience of
capabilities that a firm seeks to assemble. To this end, networking is a critical activity that supports this cognition.

4.4 Chapter Summary

This chapter presented the results from the cross-case analysis. Chapter Five will present a summary of the research findings, discuss further implications, provides recommendations, identify contributions of the research, and provide suggestions for further research.
CHAPTER FIVE

RESULTS, DISCUSSION AND IMPLICATIONS

5.1 Introduction

This chapter summarizes the research findings, provides recommendations for professional practice, identifies contributions of this research and discusses implications for future research. The research aims were to identify how managerial cognition impact changes in the resources and capabilities of Singapore’s design firms.

The current study examined how managerial cognition impacts changes in the resources, routines and capabilities of Singapore’s design firms. The study focused on the particular influence of external changes on managerial cognition and the subsequent changes to the firm’s dynamic and operational capabilities and whether managerial cognition of capability purpose and capability salience are precursors to the assembly of capabilities. Through the theoretical lenses of the RBT and DC frameworks, the study developed insights on changes in firm capabilities which enhanced the competitiveness of design firms. The evidence from the case studies supports the importance of knowledge assets in design firms (von Nordenflytch, 2010; Løwendahl, 2005, Maister, 1993) and indicates that modifications to their value-creating processes highlights important inter-relationships between managerial cognition, knowledge accrual and dynamic capabilities (Maister, 1993). The results of the study provide support for the
theoretical propositions that were brought forward from the literature.

The key findings and contributions of this research will be summarized and discussed in this chapter. The following sections will first discuss the study’s initial conceptual model and propositions. Next, the study’s contributions to the strategy literature and the RBT and DC frameworks are discussed. The study’s theoretical and practical implications, its limitations, and future research opportunities conclude the thesis.
5.2 Discussion of Model and Propositions

The current study had originally proposed two main propositions for investigation.

Proposition 1:

Managerial cognition which encodes knowledge accrued from the operating environment which will likely lead to the assembly and/or modification of dynamic capabilities, and subsequent modification of the firm’s operational capabilities.

Proposition 2a:

Managerial cognition of capability purpose is antecedent to the assembly of dynamic capabilities.

Proposition 2b:

Managerial cognition of capability salience is antecedent to the assembly of dynamic capabilities.

Proposition 1 pertained to the relationships between managerial cognition and knowledge acquisition in uncertain markets and change triggered via new or modified dynamic capabilities. Propositions 2a and 2b pertained to the relationships between managerial cognition of the firm’s capability purpose and capability salience and the assembly of dynamic capabilities. The evidence from the within-case and cross-case analyses support the propositions.
The case firms exhibited needs and requirements for elements in each component of their resource base. All companies demonstrated that the key attributes of their competitiveness depended heavily upon their managerial cognition and knowledge base (Greenwood et al., 2005) and that knowledge accrual was a critical resource in their firms (Grosse, 2000; Maister, 1993). Design firms remained competitive by bundling their resources and operational capabilities, which enabled them to continue to provide their business offerings by supporting their ability to sell, produce, and deliver their services.

Dynamic capabilities were observed in all cases. They were deployed as change processes that enabled the firms to reassemble their resources and capabilities subsequent to performance evaluation, knowledge management, new development or service innovation. However, as the literature suggested, changes to the firm’s resource base occurred subsequent to the firm’s acquisition and
absorption of new knowledge into its knowledge base (Winter, 2003). These changes were observed subsequent to the firm’s problem cognition or understanding of a strategic opportunity. Recurring needs that were recognized in these firms were often in relation to their ability or inability to ensure proper delivery because of available resources (Løwendahl, 2005), further providing evidence of their reliance on their human capital (von Nordenflytch, 2010). Opportunities were rather related to new development or market diversification and were often detected by absorbing and accumulating knowledge from the firms’ networks (Owusu et al., 2007; Eriksson and Chetty, 2003).

The findings indicate that the cognitive and learning processes by which the firm integrates new knowledge into its knowledge base and the ways in which the firm exploits this knowledge base are driven by the firm’s particular managerial cognition which modifies the resource base renewal process. Performance outcome results in knowledge that managers encode into routines for future reuse (Levinthal & March, 1993). Experience transforms routines through “learning by doing” (Levitt & March, 1988) and learning triggered by performance (Eggers & Kaplan, 2013) leading to the intentional absorption of new experiences to augment the knowledge stock of the firm. This highlights the iterative pattern of feedback-based learning as proposed in the conceptual model as managerial actions and outcomes are encoded into future routines. The evidence from the cases suggests that this process is fundamental to the firms’ ability to remain relevant and competitive in their markets. All cases relied on their cognitive framing in deploying knowledge base to produce and deliver their services, and the renewal of their knowledge assets was critical to remain competitive. The
cognitive ability to change their dynamic capabilities enabled them to renew their operational capabilities and resources (Zollo & Winter, 2002) on which their competitive advantages were based (Maister, 1993).

The following section discusses the findings on the conceptual model and the propositions developed from the literature.

5.2.1 Conceptual model, knowledge accrual, learning and managerial cognition

The findings from the study indicate a strong relationship between knowledge accrual from the external environment, managerial cognition and dynamic capabilities. All firms relied heavily on their networks to acquire market knowledge (Yliirenko et al., 2002; Autio & Tontti, 2002). All managers indicated that their previous personal experiences facilitated the process of problem cognition (Eggers, 2012; Baumard & Starbuck, 2005) and cognition of strategic opportunity (Gilbert, 2005) which provided them with the necessary insights to manage relationships and operations in response to environment exigencies (Cohen & Levinthal, 1990; Sapienza, Autio, George & Zahra, 2006; Westhead et al., 2001). These antecedents are particularly important to the design firms, since firms often encounter difficulty in replicating their competitive advantage when penetrating other markets (Luo, 2000).

Except for Company C, all firms were capital-light. Although design services required varying degrees of customization and high interaction intensity with their clients, managers indicated that they did not require major adaptations to their operational processes. This finding is consistent with Contractor et al (2003), who suggest that knowledge-intensive, capital light firms are able to compete globally
on account of their lower burden of tangible assets, their existing clientele, and their greater global standardization. Thus, barriers to entry are fairly low (Ball et al., 2008). However, the theoretical replication company C differed from other cases in that it was capital-intensive and needed several adaptations to its operational processes prior to gaining any traction in its external markets (Erramilli, 1990). This may possibly explain why the firm had expanded only much later in its life cycle and did so due to its inability to scale up in its domestic market. Relational capital, client relationships, repeat clientele and reputation were identified as critical resources in all firms (Uzzi, 1997). Successful client relationships are predicated upon the quality of client service, the firm’s organizational culture, and human capital. The design firm’s success with clients is dependent upon its ability to develop its service innovations, and maintain adaptable teams.

All five cases demonstrated that the founder/managerial team were the core drivers of change in design firms (Vera & Crossan, 2004) and that knowledge accrual was critical to their expansion into new markets (Anderson and Boocock, 2002). The sequence of problem cognition or opportunity recognition and subsequent managerial action may be explained by the processes of learning and knowledge accrual, as discussed above. The processes of problem cognition or opportunity recognition, evaluation and action are therefore, following the study’s definitional parameters, defined as second-order dynamic capabilities. The findings are consistent with the theoretical work that link problem cognition (Baumard & Starbuck, 2005; Cannon & Edmondson, 2001; Eggers, 2012; Haunschild & Sullivan, 2002) or opportunity recognition (Shane & Venkataram, 2000; Dutta & Crossan, 2005) and managerial cognition (Eggers & Kaplan, 2013).
Experience was the primary source of knowledge accrual, as a means of absorbing knowledge. All firms had previously used experience and grafting as means of acquiring new knowledge. External source of knowledge, particularly professional networks and organizations, business partners and clients, were especially important in the firms' knowledge accrual and absorption processes (Awuah, 2007; von Nordenflytch, 2010). Networks were used to acquire knowledge that then acted as a basis for its decision making (Freeman & Sandwell, 2008). More importantly, the knowledge and experience that was gained and absorbed by the founder/owner or management team had a subsequent effect on future managerial decisions (Kuivalainen et al., 2012).

Strategic action subsequent to problem cognition or recognition of an opportunity and the integration of new knowledge resulted in changes to the dynamic capabilities in all five firms which is consistent with the study’s conceptual model.

In all cases, managerial cognition influenced how knowledge was absorbed and integrated into the firm’s knowledge base. Regardless of the ways by which the firms changed, the impact of managerial cognition on learning led to a renewal of the firms’ resources and capabilities as their resource base components were modified through dynamic capabilities. This is consistent with the literature, as the evidence demonstrates the influence of managerial cognition on the firms’ ability to renew their resource base as they faced changing external environments (Crossan et al., 1999; Eggers & Kaplan, 2013). An important process by which firms changed was through the assembly of dynamic capabilities (Zollo & Winter, 2002; Easterby-Smith & Prieto, 2008; Eggers & Kaplan, 2013). The findings support the assertion that dynamic capabilities are important for the continual evolution of firms (Newbert, 2005). They were found to encourage and facilitate
firm growth and competitiveness, whether directly or indirectly, in all cases (Griffith & Harvey, 2001). Firms demonstrated that they acquired new knowledge from the external markets, and by assembling or making changes to their dynamic capabilities, it had a subsequent impact on the firm’s value-creating operational capabilities.

Although the nature of the dynamic capabilities differed between cases, the results indicated an underlying similarity in the cognitive and learning processes in the assembly of dynamic capabilities. The founders/owners and managerial teams would recognize the opportunity and necessity for change, evaluate the opportunity and act upon the acquisition of new knowledge by assembling a new dynamic capability or modifying an existing one. This finding is consistent with the literature (Gilbert, 2005; Baumard & Starbuck, 2005; Eggers, 2012; Haunschild & Sullivan, 2002; Shane & Venkataraman, 2000). The framework provided for the adoption of a new perspective on managerial cognition, learning, opportunity recognition and subsequent decision making in design firms.

Once modified or assembled, the deployment of dynamic capabilities was the firms’ way of exploiting their existing knowledge base and creating changes in their operational capabilities and resources. The dynamic capabilities embodied the institutionalized knowledge that was then used to modify and change the firms’ operational capabilities and resources. Consistent with the conceptual model, managers learn from experiences about changes in the external environment. This experience is the initial input to enable managers to make strategic choices about the assembly of capabilities which leads to performance outcome. The outcome contributes to further experience and managerial cognition since firm
performance in the current period becomes prior experience that drives the capability assembly process in the future. Managerial cognition encodes this new knowledge in making strategic choices about the direction and nature of the capability assembly to take. This results in an iterative process of feedback-based learning as managerial actions and performance outcomes are encoded into routines for future reuse (Eggers & Kaplan, 2013; Levinthal & March, 1993). At the case firms, experience came from “learning by doing” (Levitt & March, 1988) and learning triggered by prior performance (Eggers & Kaplan, 2013). Thus, the feedback loops shape the encoding of experience into routines by initiating the capability assembly process as managers realized that they lacked the necessary resources or routines to assemble the desired capability. The triggers lead to intentional absorption of new knowledge or experience to augment the existing knowledge base. Evidence of these processes occurring at the case firms are as follows:

i. absorption through Internal search and development (Gavetti, 2005)- Company C invested in technology to improve productivity and continually build capabilities in its internal processes and routines

ii. learning from others (Haunschild & Miner, 1997)- Company A learned from clients recommendations to secure business in target markets

iii. learning through hiring (Rosenkopf & Almeida, 2003)- Company A & B. Company B hired a new Design Director to lead the new team to assemble service innovation capability
iv. learning through alliances and mergers (Khanna, Gulati & Nohria, 1998)-
Company E acquired an Australian-based design firm to build its service innovation capabilities

The evidence provided an explanation for the existence and interaction of second-order learning, the cognitive ability of the firm to identify, accrue and exploit new knowledge through the firm’s capability to leverage its network of business contacts. The interaction between these three factors feed into the capability to purposefully change the resources of the firm. Changes in the firm’s dynamic capability fed into the organizational learning as new learning led to new contacts which offered new insights or perspectives on business issues. As the firm’s dynamic capabilities evolve, they influenced the absorptive capacity in the nature and direction of searches for new knowledge. The interaction between the three elements enabled learning which had a positive impact on the firm by driving change in the firm’s resources base. Thus the study finds support for Proposition 1.

**Proposition 1:**

Managerial cognition which encodes knowledge accrued from the operating environment will likely lead to the assembly and/or modification of dynamic capabilities, and subsequent modification of operational capabilities.

5.2.2 Managerial cognition and the capability assembly process

The findings suggest that when managers of design firms in Singapore are faced with environmental opportunities or threats, they intuitively sought to understand
their organizations’ capabilities—both existing and potential, to ascertain the appropriateness of routines that may be assembled into the necessary capability to respond to these opportunities or threats. This managerial awareness shaped how the case firms pursued new opportunities and determined how routines were assembled into capabilities and how they perceived the potential value of those capabilities. This finding extends the prior research of Danneels (2011) and Kaplan and Eggers (2013) by unearthing deeper insights into the cognitive processes of managers with respect to the assembly of capabilities. These insights are discussed in the following section.

5.2.2.1 Managerial cognition of capability purpose

Eggers & Kaplan (2013) argue that the articulation of capability assembly is an important cognitive process necessary to build a better understanding of how cognitive affects the assembly of capabilities from the building blocks of routines and resources. All firms implicitly had an understanding or interpretation of capability purpose as central to the capability assembly process, although this knowledge was not codified within the firms’ knowledge base. Consistent with Salvato (2009) and Levinthal & Rerup (2006) managers intuitively perceived the need for new routines to assemble the desired capabilities to respond to environmental change, and this process of intended routine creation played an important role in altering the case firms’ stock of available routines and capabilities. Capability purpose occurred at the firms because managers had either perceived some shortcomings at their firm or a strategic opportunity external to the firms. For instance, the removal of trade barriers which had caused
the failure of many smaller firms had resulted in a cognitive change in managers at the firms with purposeful intent to assemble new capabilities or modify existing ones to help the firms survive the onslaught of large foreign competitors. The managing partner of Company B had first perceived an unmet market need for Western-styled, modern designs to appeal to the growing affluence of the Chinese market which made him realize a fit between the needs and available resources, leading to the assembly of service innovation capabilities to penetrate this market. Managers used their cognition of the firm’s strategic goal to shape their understanding of the potential value of the routines that the firm possessed. This vision of managerial alertness provided the necessary purposeful interpretive process for capability assembly to occur at the firms. The purposive view of managers were built upon their prior experience and knowledge to diagnose the potential opportunities and the identification of capability purpose for the deployment of capabilities were central in the process by which capabilities were assembled from routines and resources at the case firms (Gregoire et al. 2010). Thus, the study finds support for Proposition 2a.

**Proposition 2a:**

Managerial cognition of capability purpose is antecedent to the assembly of dynamic capabilities.

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**5.2.2.2 Managerial cognition of capability salience**

The second cognitive antecedent to capability assembly is managerial understanding of what the firm can do with capabilities that it does or does not
possess (Eggers & Kaplan, 2013). Although there were differences in cognition between managers, the managerial cognition of the founders or owners at the firms generally took precedence over how capabilities were assembled. The main mechanism by which managers at the firms learned about their own firms’ skills was through direct experience, especially those of the founder or managing partner. The evidence indicated that this knowledge was derived largely from the founder or managing partner’s direct personal interactions with people and activities within the firm. Through repeated problem solving of similar situations, managers built new routines through sustained interaction with other team members which were cognitively encoded into tacit knowledge about how managers can complete tasks and in the process, helped managers to understand the relevance and usefulness of capabilities within the firm (Cohen & Bacdayan, 1994). Managers were also found to develop an understanding of capabilities by comparing with other firms. All firms gathered information from their networks and benchmarked their own firm’s strengths and weaknesses against other firms (Drew, 1997) and cognitively identified the capabilities they felt would be necessary for their firms to assemble in order to compete successfully. This suggests that managerial cognition of capability salience was present at the firms and hence, Proposition 2b is supported.

**Proposition 2b:**

*Managerial cognition of capability salience is antecedent to the assembly of dynamic capabilities.*

The current study extends the research on managerial cognition and capabilities by uncovering the linkage between cognition and capabilities. Managerial
cognition heavily influenced the assembly of capabilities. Prior experience and cognitive models direct the way in which a capability is assembled. This is consistent with the assertion of Eggers and Kaplan (2013). However, there was no evidence in the study to suggest that any of the firms codified this capability assembly process. The case firms’ main cognitive challenge was to manage the assembly effort such that it pinpoints the most important capabilities to support the firm’s strategy. As managerial skills are generally in short supply, the ability of managers to recognize the intended purpose of capabilities that they need to assemble (i.e. capability purpose) and what the firm can do with these capabilities (i.e. capability salience) is crucial to the firm's success. The dismantling of the trade barriers forced all the case companies to rethink their business models and invest in capability assembly in several areas concurrently.

5.2.3 Summary of Findings

The aim of this study was to learn more about managerial cognition and how they impact the assembly of the firm’s capabilities and influence strategic decision making. It was demonstrated in the literature review that managerial cognition, learning and experience are implicit to the assembly and/or modification of dynamic capabilities (Eggers & Kaplan, 2013). Firms accrued knowledge through their market activities, learn, and encode prior experiences into their cognition which led to subsequent changes to their strategic decisions in their competitive activities. The findings of this thesis demonstrate that design firms make these changes by way of change processes influenced by managerial cognition. From the case evidence, a relationship between managerial cognition, learning and
dynamic capabilities was unearthed. As a result of this finding, the study suggests that repetitive and patterned use of similar behavior leads to the encoding of experience and learning into the firm’s managerial cognition which, in turn leads to the assembly of dynamic capabilities. This is important in design firms because value is continuously created in their operational capabilities as they learn and encode the experiences from their production and delivery processes to improve the efficiency and effectiveness of future projects (Eggers & Kaplan, 2013; Løwendahl, 2005). As dynamic capabilities are costly to implement and maintain, repeated ‘learning by doing’ and learning from prior experience may be sufficient to trigger the necessary changes to the firm’s operational capabilities. However, as the firm grows, the firm’s needs in terms of types and combinations of resources and capabilities do change and evolve (Penrose, 2009). It will thus be necessary to continually assemble capabilities to support complex relationships that design firms have with their clients (Reichheld & Sasser, 1990), which will enable them to build relational capital (Uzzi, 1997) and long-term, trust-based client relationships (Vanchan & MacPherson, 2008). As design firms are highly dependent upon these client relationships, and these relationships become a reflection of their clients’ willingness to continue to pay for their services, design firms will need to continually learn from their operations and develop the necessary managerial capability by leveraging the resource base available to them. Thus, it becomes inherently critical for a design firm to identify when changes to their production and delivery processes would trigger these processes. By repeating the behavior adopted when facing similar situations in decision making and encoding these experiences into their cognition, design firms may learn to assemble appropriate dynamic capabilities to compete. If managers are
able to develop managerial cognition of capability purpose and capability salience as necessary components of their managerial capability, it will enable them to purposefully act to interpret the environment in new ways, assemble to capabilities to match those opportunities (Bingham et al., 2007; Gavetti & Levinthal, 2000; Eggers & Kaplan, 2013) and build firm adaptability (Zollo & Winter, 2002).

The study found no formally codified cognitive routines or specific R&D; they often occurred emerged or evolved, due to the managerial cognition and leadership of the founder or managerial teams in all cases. This is consistent with Nam and Tatum (1997). The firm’s ability to innovate its service offerings without a specific plan contrasts with researchers who argue that constant cognition of innovation leadership is necessary (Sexton and Barrett, 2003). The finding is consistent with Susman et al.’s (2006) assertion that less scalable service firms do not invest directly in research but engage actively in continuous developments and improvements leading to service innovations. In the case firms, development activities (e.g. design and engineering processes, prototype development) were partly or wholly funded by clients, through the project budgets. All changes brought about by firms resulted primarily from processes that relied on the managing partners’ cognition and vision. The study reinforces Susman et al.’s (2006, p. 10) view that less scalable firms would need to pursue strategies that focus on client intimacy rather than scale of production or marketing.

The study finds that the managerial cognition of capability purpose and capability salience are important precursors to the assembly of capabilities and managers’ past experiences are critical to the strategic choice. The study is also consistent
with empirical research from strategic management that differences in managers’
cognitive frameworks cause firms to react differently to external stimuli (e.g., Fiol,
1989; Barr et al., 1992), and that managers’ subjective perceptions influence how
these decision makers view competitive environments and firms (Lant and
Baum, 1995). Within the context of competitive dynamics research, executives’
cognitive frameworks explain why executives at a firm are systematically more
likely to challenge some types of competitive action, but ignore others.

The literature on dynamic capabilities continues to gather pace, but examination
of this phenomenon in design firms continues to be sparse. The findings highlight
the need for additional research to further empirically examine the relationships
between managerial cognition, learning and change in firms. As the study’s
findings demonstrate, firms do behave differently and the creation and
development of their capabilities are centered on the managerial cognition,
decisions and actions of the founder/managerial teams.

5.3 Contributions of Research

The current study responded to the call for empirical examination of the impact of
managerial cognition and learning on the assembly of capabilities in firms (Gavetti
& Rivkin, 2007; Kaplan & Henderson, 2005), and the perspective of cognition as
critical to the micro-foundations of the RBV and DC constructs (Eggers and
Kaplan, 2013; Vera et al., 2011). The current thesis demonstrated through case
studies how, within the context of Singapore’s design industry, managerial
cognition and learning influenced the assembly of dynamic capabilities and the
modifications of the firm’s operational capabilities and routines, which in turn impacted the firm’s renewal of its resource base. The findings from this study provide support for the logic behind cognition of capability purpose and salience, the capability assembly process and the hierarchal differentiation of capabilities. Theoretical contributions are made by qualitatively examining the impact of managerial cognition and learning on the firm’s resource base renewal process.

The study contributes to strategy research by providing a framework to depict the capability assembly process in a new, detail-rich manner and demonstrated a new level of ‘granularity’, according to which capability assemblies are compared across firms. The study finds that managerial cognition of capability purpose and capability salience are critical attributes for firms seeking to assemble new capabilities (e.g. Eggers and Kaplan Gavetti and Rivkin, 2007), even though the relative importance of these capabilities many change over time.

There continues to be a gap between abstraction of the RBT and DC constructs and empirical verification, which is limited in the strategy literature. Through case studies, this gap has been reduced by offering examples of modified operational capabilities that provide evidence of second-order capabilities and change via dynamic capabilities driven by cognitive change triggered by change in the external environment (Winter, 2003; Easterby-Smith & Prieto, 2008; Vera et al., 2011). In doing so, the role of learning is made clear in relation to the evolution and utility of dynamic capabilities within the firm’s
resource base renewal process. The findings provide initial empirical results; however, additional research is required to further examine these relationships.

The utility of the cognitive, RBT and DC constructs as the study’s theoretical framework introduced to the strategy literature a new theoretical lens through which changes in managerial cognition and learning may be observed. The initial findings demonstrate that the relationships between managerial cognition, learning, capability assembly and modifications to the firm’s resource base renewal are consistent with recent theoretical advancements in the literature. The initial findings also suggest that these relationships are present in design firms with important implications for the firms’ competitiveness. The learning processes that drive change through dynamic capabilities hold important explanatory power when considering the resource base renewal that is necessary for knowledge-intensive firms to remain competitive in the markets in which they operate. In this respect, the main contribution of this research is the application of the RBT and DC framework in explaining triggered change subsequent to the accrual and absorption of new knowledge from the firm’s operating environment.

The findings of this study also provide data with which to create and test measures to further extend the cognitive, RBT and DC constructs in knowledge-intensive, design firms. Quantitative tests are required to further empirically examine this phenomenon and provide additional explanatory value to the cognitive, RBT and DC constructs in design firms. The cognitive, RBT and DC
constructs offer a different understanding of the evolution of knowledge-intensive firms, as they provide insights from a cognitive, resource-based perspective.

5.4 Managerial and Practical Implications

From a practical standpoint, this study provides greater insight into the managerial cognition and the capability assembly process in Singapore’s design industry. Given the current state of Singapore’s commercial trade balance of services and the importance of services in developed economies globally, gaining insight into how services evolve and learn from their changing environment can further help researchers in providing policy makers with crucial factors promoting cross-border trade.

The design firms examined in this study demonstrated cognitive determination to learn from their competitive environment and to reassemble their resource base in order to compete. They depended heavily upon their network relationships to access new information and knowledge was largely accrued through their experiences. These observations have implications for owner/managers.

The process by which opportunities were sensed and integrated into the firm’s knowledge base triggered the assembly or modification of dynamic capabilities. Not all firms require the development of costly dynamic capabilities. However, managers should recognize their continuous reversion to learning by doing when faced with similar situations as an opportunity to invest in change processes.
These may have performance implications, as the firm begins making iterative changes in innovations and improvements to its services and processes, in alignment with the firm’s strategic objectives. Additionally, as the firm grows, codification of the knowledge processes will need to be put in place to leverage on the firm’s capability to learn and accrue new knowledge, while absorbing it into its knowledge base.

It is necessary for managers to learn to develop managerial cognition of capability purpose and capability salience as components of their managerial capability, since it will enable them to purposefully act to interpret the environment in new ways, assemble new capabilities to match those opportunities and build firm competitiveness. Not only should owners and managers drive the cognitive purpose to learn, they should also drive other members of their firms to learn from their experiences and encode this new knowledge into the firm’s collective knowledge base.

Design firms will need to actively engage in continual knowledge accrual. These include monitoring activities in leading markets, investing in market data, attending trade shows and association meetings, developing extensive networks of contacts and other frontier knowledge development activities. The Singapore government could provide support for the local industry by developing learning programs to help firms develop managerial cognitive skills in capability purpose and capability salience and to broadly understand the capability assembly process. Firms would then be better positioned to make superior resource allocation decisions. The
Design Council Singapore (DCS), as the government agency, could spearhead this effort. Valuable insights into policies would be gained that may have hindered firms from establishing footholds outside Singapore in the past. These insights would help the government to develop effective policy options to minimize or eliminate the adverse effects of policies on the future success of Singapore’s design firms.

5.5 Limitations of the study

The methodological approach chosen in this research has some inherent limitations.

First, the findings are drawn from the collection and analysis of data from a small sample of firms within the design industry in Singapore. Thus, the main limitation of the study is the size and scope of its sample, as it looks specifically at a small sample of a segment in a highly heterogeneous industry. The study’s objective was to provide explanatory evidence of theoretical relationships and linkages between managerial cognition and capabilities that have yet to receive empirical attention. Given the complexity of the relationships examined, the objective was not to achieve statistical generalization but rather analytical generalization (Yin, 2003). The study’s limited size was resolved by collecting multiple sources of data relevant to the changes that occurred in the firms in response to environmental shifts and by completing in-depth analyses for each case.

Second, the research examined dynamic processes, but collected cross-sectional data, which may not have developed sufficient insights on the nature of the
managerial cognition and capability assembly process in firms over time. It would be logical to conduct longitudinal studies to observe these organizational processes. Although the study incorporated selection criteria in its sampling strategy, all firms that participated in the study had been operating for at least 13 years in the design industry. As all five firms had chosen to remain mid-sized and had been established for quite some time, the findings may need to account for survivor bias.

Third, the study was limited to firms founded in Singapore, although most of these firms have penetrated markets outside Singapore. Nevertheless, as competitiveness of firms is rapidly diffusing across national borders, studies limited to a single market may have diminishing impact. Greater insights may be gained by future research that expands the geographic boundaries to include a broader array of global markets.

A final limitation is that the data from this study were largely based on subjective reports by a small sample of managers and hence, the insights that can be drawn are limited to the data of those managers. Therefore, the subjective nature of the methodology suggests that managers may not have completely or accurately identified all their firms’ strategic resources. Nevertheless, this remains a prescriptive limitation of the RBV, since managers may not know, for sure, which resources will enable their firms to achieve success (Barney & Arikan, 2001).
5.6 Suggestions for further research

The findings of the current study provide several opportunities for future research. First, further empirical work should aim to examine at a more granular level the micro-foundations and linkages between managerial cognition and the capability assembly process (Eggers and Kaplan, 2013). Findings from this particular research stream could enrich the design industry’s understanding of managers’ cognitive processes and capabilities as design firms seek to compete globally.

There is also the opportunity for future research to incorporate other qualitative research methods, such as participant observation and experiments. Alternative approaches to the case study methodology would provide different viewpoints and observations of this particular phenomenon. The findings would thereby enrich our understanding of the cause-effect relationships between managerial cognition, learning and reconfiguration of the firm’s resource base. As the temporal setting in which the phenomenon takes place is important, longitudinal research methodologies should also be adopted.

The research design could be applied to other industries and geographical contexts to enhance the external validity. As the study by Madhoc and Osegowitsch (2000) offers, the country of origin may be a crucial factor shaping cognition and capability assembly, since the origins of the firms impose a series of traits on their capabilities, derived from their culture, legal framework, and orientation to learning and knowledge accrual. Thus the capabilities assembled in one context are likely to differ from those assembled in other geographical
frameworks. Further research is necessary to determine the extent in which the capabilities developed in this research are present in other firms and geographical environments, and whether these capabilities do in fact drive competitiveness for other firms.
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INFORMATION STATEMENT

Name of Research Project: A RESOURCE-BASED VIEW OF THE COMPETITIVENESS OF DESIGN FIRMS IN SINGAPORE

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1. The purpose of this research is to identify how changes in the external environment influence managerial cognition and the design firm’s ability to learn, assemble and modify its resources and capabilities to compete in Singapore. The project would shed light on the process of capability assembly and recommend strategies that managers may take to enhance their firms’ competitiveness. The findings of the project will be shared with the participants at their request. The research would involve semi-structured interviews with senior managers of firms with an interview guide given some time before the interview. We will request that you share additional internal documents such as minutes, memos, annual objectives and reports, project portfolio, and assessment appraisals that would enable us to better understand your firm strategies.

2. Appointments will be made with participants at least 5 days before the interview. Each interview will last between 1 to 1.5 hours. An interview guide will be forwarded to you at least 5 days before the interview. The conversation will start with brief introduction, review of research objectives and format of the interview. Questions regarding confidentiality will be addressed. The interview will then be...
conducted along the lines of the interview guide. There will be some probing questions but there will not be any comment in the final report which would jeopardize the participants’ standing or cause any anxiety within the firm.

3. I am not aware of any risks involved in participation of this project.

4. The results for this research project will be used only for academic work and not for commercial purposes.

5. The interview will be audio taped with your permission.

6. Your responses will be held in strict confidence. No identifiable reference will be made to any person or firm in the report.

7. There is, of course, no obligation to participate in this project. You are free to withdraw from this project at any time.

Charles Sturt University’s Human Research Ethics Committee has approved this project (HREC Ethics Approval Number: 209/2009/03). If you have any complaints or reservations about the ethical conduct of this project, you may contact the Committee through the Executive Officer:

The Executive Officer, Human Research Committee
Office of Academic Governance, Charles Sturt University, Panorama Avenue, Bathurst NSW 2795, Australia
Phone: (02) 6338 4628 Fax: (02) 6338 4194

Any issues you raise will be treated in confidence and investigated fully and you will be informed of the outcome.

9. I would like to seek your agreement to participate in the research.

10. If you require further information, please contact Samson Tan: +65- 94300040; email: samson@samsontan.com

Samson Tan, DBA Candidate
Faculty of Business, Charles Sturt University
APPENDIX B

CONSENT FORM

DBA Candidate

Name of Research Project: A RESOURCE-BASED VIEW OF THE COMPETITIVENESS OF DESIGN FIRMS IN SINGAPORE

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Your consent to be interviewed for “A cognitive, resource-based theory of the competitiveness of design firms in Singapore” is requested. Details of this project can be found in the Information Statement. If you require further information, please contact the researcher:

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I understand that by signing this consent form I agree to the following:

1. I understand that I am free to withdraw my participation in the research at any time, and that if I do I will not be subjected to any penalty or discriminatory treatment;

2. The purpose of the research has been explained to me, including the (potential) risks/discomforts associated with the research;

3. I have read and understood the information sheet given to me.

4. I have been given the opportunity to ask questions about the research and received satisfactory answers;

5. I understand that any information or personal details gathered in the course of this research about me are confidential and that neither my name
nor any other identifying information will be used or published without my written consent;

6. I understand that interviews will be audio taped and consent to this.

Charles Sturt University’s Human Research Ethics Committee has approved this study (HREC Ethics Approval Number: 209/2009/03). I understand that if I have any complaints or concerns about this research I can contact:

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<th>Executive Officer</th>
<th>Signed by: .............................................</th>
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<td>Human Research Ethics Committee</td>
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<td>Office of Academic Governance</td>
<td>Date: ..................................................</td>
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APPENDIX C: INTERVIEW GUIDE

Study title: “A resource-based view of the competitiveness of design firms in Singapore”

Information to be obtained from case firms
1) Interviews with senior managers
2) Internal documents, such as business plans, letters, faxes, minutes of meetings, project portfolio, financial statements (optional)
3) Information on the firm, e.g. the firm’s scope of services, company brochures, website, etc.

History of the firm and milestones
Obtain information from managers using a chronological timeline with the following milestones to provide guidance:

a) Date of inception of the firm
b) First penetration of foreign markets
c) Subsequent penetration into foreign markets to date
d) Assembly of new services
e) Demise of existing services

Background Questions
1. Manager’s role: job title, responsibilities in the firm
2. Firm background: predominant business activities, ancillary activities
3. Size of firm in Singapore prior to foreign expansion (sales, employees, offices)
4. Managerial cognition of strategic goals to compete within the local market
5. Managerial cognition of core resources within the firm to service local clients
   a. Managerial cognition of assets: financial resources, technologies, intellectual property, human resources, reputation, expertise.
6. Managerial cognition of capabilities that have enabled the firm to compete locally
   a. Managerial cognition of capabilities: managerial skills, project management expertise, resource allocation capabilities, R&D capabilities, sales and marketing capabilities
7. Managerial cognition of the most crucial resources and capabilities which enabled the firm to stand out from the competitors?
8. Managerial cognition of the firm’s competitive advantage in the market.

First foreign expansion activity
1. Please describe the firm’s first penetration of a foreign market
a. Who, when, where, for how long, and what nature of services?
i. Gestation activities, e.g. business plan, develop network contact
ii. Search, discovery, serendipity
iii. Managerial cognition of decision-making process
iv. Managerial cognition of resources and capabilities in the firm that enable it to serve its first foreign markets, and the resource allocation process
v. External environment: capacity for knowledge absorption, accrual, transformation, and exploitation
vi. Internal environment: capacity for intuition, interpretation, integration and institutionalization
b. Time frame between cognition of the strategic opportunity and exploiting it?
c. Obstacles in penetrating foreign market?
d. Managerial cognition of how the foreign markets operated prior to penetration
i. Managerial cognition of country culture, business culture, networking and capital needs, legal issues, business relationships needed, nature of suppliers and partners.
ii. Process of knowledge accrual? Utilization of this knowledge

2. Outcomes of first foreign expansion activity
a. Impact on value creating processes:
i. Client needs cognition, and subsequent sale of service to satisfy client needs;
ii. Service delivery activities resulting in successful project outcome;
iii. Managerial cognition and learning in the previous two processes to improve efficiency and effectiveness of future projects.

3. Cognition of capability assembly
a. Managerial cognition of capability purpose necessary to complete foreign project
b. Managerial cognition of capability salience necessary to complete foreign project
c. Were resources and capabilities necessary to service the client adapted/modified to suite the foreign market? Were the assembly of new resources and capabilities necessary? How were these assembled?
d. Impact on firm’s service bundle: were there changes to the services of the firm?
e. Impact on the firm’s organizational structure
f. Was the knowledge and information accrued valuable to the firm? If so, how did it impact the firm?
g. Changes to the firm’s cognition and behavior towards foreign opportunities: was managerial cognition favorable or non-favorable?

4. Costs of this first foreign market activity?
a. Did the benefits outweigh the costs?
b. Financial implications derived from this first foreign market activity?

5. Subsequent foreign expansion activities
1. Please describe the firm’s subsequent penetration of a foreign market
a. Who, when, where, for how long, and what nature of services?
i. Gestation activities, e.g. business plan, develop network contact
ii. Search, discovery, serendipity
iii. Managerial cognition of decision-making process
iv. Managerial cognition of resources and capabilities in the firm that enable it to serve its first foreign markets, and the resource allocation process
v. External environment: cognition of capacity for knowledge absorption, accrual, transformation, and exploitation
vi. Internal environment: cognition of capacity for intuition, interpretation, integration and institutionalization

b. Time frame between cognition of the strategic opportunity and exploiting it?
c. Obstacles in penetrating foreign market?
d. Managerial cognition of how the foreign markets operated prior to penetration
i. Managerial cognition of country culture, business culture, networking and capital needs, legal issues, business relationships needed, nature of suppliers and partners.
ii. Process of knowledge accrual? Utilization of this knowledge

6. Outcomes of subsequent foreign market activities
a. Impact on value creating processes:
   i. Client needs cognition, and subsequent sale of service to satisfy client needs;
   ii. Service delivery activities resulting in successful project outcome;
   iii. Managerial cognition and learning in the previous two processes to improve efficiency and effectiveness of future projects.

7. Cognition of capability assembly
a. Managerial cognition of capability purpose necessary to complete foreign project
b. Managerial cognition of capability salience necessary to complete foreign project
c. Were resources and capabilities necessary to service the client adapted/modified to suite the foreign market? Were the assembly of new resources and capabilities necessary? How were these assembled?
d. Impact on firm’s service bundle: were there changes to the services of the firm?
e. Impact on the firm’s organizational structure
f. Was the knowledge and information accrued valuable to the firm? If so, how did it impact the firm?
g. Changes to the firm’s cognition and behavior towards foreign opportunities: was managerial cognition favorable or non-favorable?

8. Other information
Other data available to support case:
- Sales data, accounts, annual reports and financial statements
- Portfolio of projects
- Mission statement, company brochures
- Trade magazines, newspaper articles.