EXPLICATING THE MANAGERIAL PROCESSES OF DYNAMIC CAPABILITIES AND INVESTIGATING
HOW THE RECONCEPTUALIZED CONSTRUCT INFLUENCES
THE ALIGNMENT OF ORDINARY CAPABILITIES

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In the last three decades, strategic management scholars have explored the organization’s need to reconfigure its capabilities to leverage opportunities in a changing environment. The first objective of this study was to identify the underlying elements of the managerial processes of dynamic capabilities, and to offer a reconceptualization of the dynamic capabilities construct. The second objective of this investigation was to determine how the reconceptualized dynamic capabilities construct could influence the alignment of ordinary capabilities.

Findings from this investigation indicate that organizational processes and managerial processes are unique components of dynamic capabilities. In addition, these organizational processes were found to be significantly and positively correlated with the alignment of ordinary capabilities. Furthermore, managerial processes were found to moderate the relationship between organizational processes and one type of ordinary capability alignment (i.e. innovation-operations capability alignment). Taken together, the findings of this study support the notion that dynamic capabilities are context specific, and that understanding how they influence the organization’s ability to change is complex.

The developments and findings in this study offer a reconceptualized and empirically tested framework for the capability alignment process, thereby providing a more comprehensive picture of the underlying processes.
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CHAPTER 1

INTRODUCTION

Scholars have explored the challenges that organizations experience as they seek competitive advantage in an evolving environment. In the last two decades, strategic management scholars have explored the organization’s need to constantly reconfigure its resources and capabilities to leverage opportunities in a changing environment. This scholarly interest in resource and capability adaptation marked a shift within the field of strategic management from a focus on industry structure and dynamics to internal, organization specifics such as resources and capabilities. The shift illustrates the complexity that researchers face when investigating such phenomena.

Since an important objective of an organization is to achieve or exceed its stated performance goals, scholars have offered a number of theories, anchored in organizational theory and strategic management, to explain organizational change and its relationship to performance of the organization or to performance variation across organizations. The theoretical perspectives used in this dissertation are representative of advances in our understanding of how organizations adapt to environmental changes. They provide different lenses to explain organizational change but, as will be detailed shortly, no one theoretical perspective provides a complete picture of the phenomenon.

This chapter introduces theoretical perspectives used in prior research of organizations, change, and uses them to identify appropriate research questions that I address in this dissertation. A brief description of each theoretical perspective, and an explanation of its potential contribution to organizational change research follows. The chapter begins with an
overview of the industrial organization (IO) economic perspective and ends with a discussion on one that is operational in nature (i.e., alignment). Discussion of the various perspectives begins with an outside view of the organization by utilizing IO economics to explain why groups or industries of organizations may change. Beginning with IO economics offers insight into the early developments of the field of strategic management, which explained how and why firm performance differed across organizations. As the discussion progresses, the focus shifts from external perspectives (e.g. IO economics) to those that are internal (e.g. capability alignment).

Chapter 1 begins with a review of the literature on IO economics. In the 1960s, government policymakers used the IO perspective to formulate economic policy (Barney, 1986b). Governments sought to prevent the onset of monopolistic behavior by creating controls for groups of organizations where anticipated organizational returns were high (Hirshleifer, 1980). From this, organizations devised approaches that allowed them to compete in a given environment. However, the specific changes each organization undertook were not of significance. Instead, the “group” of organizations responded to survive.

Unlike the IO perspective, the capabilities-based perspective specifically looked at individual organizations and sought to combine aspects of organizational theory and strategic management to explain the organization’s ability to change to gain a competitive advantage. It allows researchers to investigate both external (environmental) and internal (organization-specific) factors; thereby, providing a representative view of the creation and deployment of organizational activities in practice. In the following section, an introduction to the IO perspective begins. Next, I undertake a discussion on two other perspectives relevant to the development in this dissertation: the resource-based and capabilities-based perspectives.
Then, I use configuration theory as a process to address how organizations seek alignment of capabilities to institute change.

The Industrial Organization Perspective

The structure-conduct-performance (SCP) paradigm employed in the IO perspective was an early attempt to administer control within industries by dissuading monopolistic behavior. The central tenet of the SCP paradigm maintains that industry structure determines organization conduct. In this view of economic activity, the government influences the structure of the industry through regulatory and economic policies and organizations make decisions about its conduct given the environment (Porter, 1981). Thus, the IO perspective argued that organizational performance stems from the firm’s conduct in the environment, and that no single organization could change the industry (Bain, 1968).

While early works employing an IO perspective helped the government use its regulatory and economic policy to influence industry behavior, later works by Michael Porter (1980) and others (e.g. Barney, 1986; Dierickx & Cool, 1989) emphasized the choices the organization could make given the factors prevalent in the environment. One contribution of IO development to practicing managers was Porter’s five forces model, which characterized the “competitive environment” in terms of rivalry, supplier power, buyer power, threat of substitutes, and possible new entrants (Porter, 1980, 1985). In this view, organizations understanding their environments could manipulate various factors to improve overall performance, in lieu of taking what the environment dictated.
There were notable contributions offered by the IO perspective. First, the IO perspective brought rigorous methodology to strategic management research, which was previously a challenge due to the predominant use of case studies to explain performance variation. Second, the IO perspective offered an outside-in view of the organization that was different from the earlier works by Chandler (1962) and Andrews (1971), which focused primarily on the organization. Finally, given its foundation in economics, the IO perspective was well received by the scholarly community. Building on insights gleaned from the IO perspective, subsequent publications by Miles and Snow (1978), Mintzberg (1978), Schendel and Hofer (1979) and others added environmental context and richness to scholarly explanations for variation in performance across organizations.

At the time it was developed, the IO perspective represented a shift in the field of strategic management from a “case-by-case” based organizational focus (inside out), to a focus that was inclusive of industry (outside in). When viewed through a configuration lens, the IO perspective emphasized the strategic choices an organization could consider, given its environment. However, this perspective offered limited insight into two tenets of the configuration perspective - structure and leadership. I now shift the discussion away from the IO perspective, to one that is more focused on what the organization does in an environment, the resource-based perspective.

The Resource-Based Perspective

Wernerfelt (1984) consolidated the next shift in scholars’ thinking and swung the pendulum from an outside-in perspective, back to an inside-out one, by focusing attention on
internal issues that served as determinants of performance variation across organizations. His work prompted a fresh perspective on performance variation by specifically examining the resources possessed by an organization. Tangible (Barney, 1986) and nontangible (Dierickx & Cool, 1989) resources were viewed as assets that organizations used to create a sustainable competitive advantage. This shift in evaluating the organization from an internal perspective created a very broad stream of research known as the resource based view (RBV).

RBV maintains that resources are the cornerstone of competitive advantage (Peteraf, 1993). That is, organizational resources can be sources of competitive advantage when those resources are valuable, inimitable, rare, and non-substitutable (Barney, 1991). Organizations that possess such resources can take advantage of imperfect factor-markets that allow for organizational heterogeneity. Heterogeneity allows the organization to create value unique from that possessed by its competitors. With the introduction of RBV, performance variation (differential rents) could now be attributed to the differences in resource and capability configurations among organizations (Barney, 1991).

As the research in this area evolved, resources were linked to core capabilities (Leonard-Barton, 1992), distinctive capabilities (Day, 1994), and organizational capabilities (Collis, 1994). With the onset of resource-based research, it became apparent that decisions regarding resource appropriation were missing at the level of the general manager (Marino, 1996) and that of middle management (King & Zeithaml, 2001). Researchers sought to explain the importance of managers in the pursuit of competitive advantage via resource acquisition (Wernerfelt, 2011), while others focused on the link between resource acquisition and resource accumulation (Maritan & Peteraf, 2011).
The internal perspective offered by RBV provided richness at the organizational level by
demonstrating the relevance of resources. In this view, resources used by organizations create
capabilities that lead to competitive advantage (Peteraf, 1993). The focus on resources not
only sheds light on how organizations visualize resources as sources of competitive advantage,
but also highlights how markets for tradable (Barney, 1986) and non-tradable (Dierickx & Cool,
1989) resources are different. However, researchers note that the mere possession of valuable,
rare, non-substitutable resources does not constitute a competitive advantage (Priem & Butler,
2001). Other researchers (Newbert, 2007; Priem & Butler, 2001) have also highlighted the
static nature of the RBV perspective and the limited role that resources play in explaining
variations in organizational performance associated with changes in organizations and their
environments. While useful in bringing attention to resources and the role they may play in
establishing a competitive advantage, RBV cannot adequately explain the dynamic nature of
organizational change.

The Capabilities Perspective

The capabilities-based perspective emerged to offer a more balanced articulation of
internal versus external focus. The capabilities perspective offers a complementary explanation
of organizational performance variation by accounting for the organization’s ability to change
its resources and capabilities over time. A detailed discussion on the nature of organizational
capabilities and on the capabilities perspective is offered in Chapter 2. What follows is a brief
introduction to “dynamic capabilities,” the central construct in this dissertation.
Dynamic capabilities: The ability of the organization to change, i.e., integrate, build, and reconfigure internal and external competences to address rapidly changing environments, suggests the existence of a unique type of capability termed dynamic capabilities¹ (Teece et al., 1997). One outcome of scholarly discussions on dynamic capabilities was the notion that this concept offered the potential to explain how organizations change and enhance their competitive advantage. This generated strong research interest in the construct.

In an attempt to extend our understanding of DCs, this investigation advances the research by illustrating how the current dynamic capabilities construct may be strengthened through further development of relevant underlying tenets. To begin this illustration, the ensuing discussion begins with configuration theory to frame the organization’s challenge of responding to environmental changes. Configuration is used as a process to help explain how organizations orchestrate their capabilities to achieve “fit.” It is argued that “fit,” or alignment, pertains to how well various capabilities work with one another. A more detailed discussion of alignment follows to help frame the challenge organizations face when seeking change. Alignment emphasizes the changes the organization must make internally to achieve the best combination of ordinary capabilities. The next section begins with configuration theory.

Configuration Theory

An organization’s configuration represents organization-specific combinations of capabilities that make the organization unique (Nelson & Winter, 1982). Dess et al. (1993)¹

¹ From this point forward, I use the acronyms DC and DCs to represent dynamic capability and dynamic capabilities respectively.
characterized configurations as a tight set of dynamics with finite combinatorial possibilities. Thus, organizational configurations represent clearly identifiable internal logic, integrity, and evolutionary momentum (Miller, 1987). Therefore, these configurations can be used to explain how different organizations, with access to the same resources, vary in the success that they achieve.

Four Imperatives of Organizational Configurations

The work by Miller (1987) centered on the different combinations of environment, structure, leadership, and strategy that make up the configuration of an organization. Miller (1987) outlined four “imperatives” that drive or orchestrate change in configurations. One of these addresses the environment, while the other three (strategy, structure, and leadership) are organization specific. Each of these imperatives is discussed below.

The Environmental Imperative

The environmental imperative suggests that organizations must adapt to their respective environments (Miller, 1987). From this perspective, environmental uncertainty constrains the choices an organization makes regarding its configuration. More specifically, incremental changes to the strategy, structure, and leadership are made to achieve a better fit with the environment (Miller, 1992). Failure to match large-scale changes with the environment may result in poor performance or even failure (Aldrich, 1979). To survive, organizations will scan and interpret environmental signals in order to make changes to its strategy and structure.
Organizational Imperatives

The Strategy Imperative. The structure-strategy debate (Chandler, 1962), suggests that organizational leaders make strategic choices to determine which businesses to be in and by default, choose the environments in which they operate (Miller, 1996). In this view, organizations are seen as creating strategies that exploit opportunities (Miller, 1987). The approach to change is planned, proactive, and purposeful (Astley & Van de Ven, 1983), allowing organizations to select which markets they will pursue and develop explicit strategies in pursuit of a competitive advantage.

The Structure Imperative. Nelson and Winter (1982) showed how the formal routines of structure influence strategy and organizational decision-making. Arguments for formal structure and rules date back to the early works of Weber (1947). Taking a mechanistic approach to structure (Burns & Stalker, 1961) can result in rigidity that may prove troublesome for organizational change (Miller, 1987). Given this, some organizations only change when they are forced to do so. Change of this nature is reactive and is typically not incremental (Miller & Friesen, 1984). Organizations possessing rigid structures are more likely to change due to internal issues than in response to challenges the environment. As a result, in such situations organizational leaders are often blind to, or ignore, the signals from the environment that suggest change. Instead, they focus on internal signals to determine a course of action (Miller, 1987).

The Leadership Imperative. The leadership imperative deals with the individual personalities and attitudes toward change as exhibited by top management of an organization (Miller, 1987). More specifically, this imperative examines the role of the CEO as it relates to
his or her preferences associated with risks, innovation, and competition. Organizations exhibiting a strong leadership imperative are likely a reflection of their CEO and his or her approach to the market. In this case, CEO turnover will likely move the organization, at least briefly, away from the leadership imperative.

To summarize, the four imperatives (one environmental imperative and three organizational imperatives) presented above illustrate consistent themes that often repeat in organizational configurations (Miller, 1987). This does not imply that the four imperatives are representative of all possible configurational elements, but that those presented, do represent imperatives typically found in organizations (Meyer et al., 1993). In addition, an organization may exhibit some degree of each of the imperatives. However, it is likely that one of the imperatives will dominate relative to the others (Miller, 1987). This is consistent with the works of Miles and Snow (1978), where they establish a typology of organizational configurations: defenders, prospectors, analyzers, and reactors. While an organization may exhibit prospector actions as its dominant typology, the same organization could also display characteristics of an analyzer, but to a lesser degree. Mintzberg’s (1979) typology, which distinguishes between simple structure, machine bureaucracy, professional bureaucracy, divisionalized form, and adhocracy also emphasized a dominant classification; however, some characteristics from other classifications also appeared, even when one typology was found to be dominant.

Alignment in Organizational Configurations

A central tenet of configuration theory is the organization’s pursuit of alignment in its own configuration. Randolph and Dess (1984) define alignment as “the proper fit” of the
organization’s configuration with its environment. They argue that alignment provides an opportunity for improved organizational performance. This was echoed by Miller (1992), when he suggested that there is a desired fit between internal and external elements of organizational life. Venkatraman (1989) went further to identify six different perspectives of fit, four of which dealt with fit from an internal or external perspective. Since organizations use unique combinations of structure, strategy, and leadership to align themselves with their environments, scholars have argued that these combinations are organization specific (Nelson & Winter, 1982) and difficult to copy (Miller, 1987).

Organizations pursue alignment in hopes of taking actions that are in concert with environmental constraints. Configuration theory offers a macro approach to conceptualize how organizations combine different elements to implement organizational change and offers insight into possible combinations of various elements that an organization may use when faced with the need to change. It also facilitates a collective view of organizational change by taking into consideration the relevant dominant imperative of the organization. The theory argues that the unique manner in which an organization is configured will influence its ability to change. For instance, if an organization is out of touch with its surrounding environment, what is the likelihood that the organization would recognize the need to change its structure or strategy if relevant factors in the environment were to shift? In this case, the organization may be unable to change fast enough to address the changes in the environment. Therefore, configuration theory provides insight into how an organization seeks alignment between the environment and the elements under its control, i.e., structure, strategy, and leadership (Nadler & Tushman, 1997). By extension, it provides an explanation for differing performances
of organizations that compete in the same environment and more importantly, offers a platform to investigate the organizational change phenomenon.

A Note on Alignment

While much of the prior discussion focuses on various theoretical perspectives to offer insight into the organizational change phenomenon, alignment offers specific insight into how well specific organizational capabilities work, or “fit,” with one another to orchestrate change in day-to-day operations. In this context, alignment represents the fit between any two capabilities.

Much of the earlier discussions dealing with alignment focused on the organization’s fit with the environment. Kathuria et al. (2007) describe this alignment as being comprised of two types – vertical and horizontal. Vertical alignment enables planning and decision-making across various levels in the organization. Horizontal alignment, on the other hand, refers to coordination efforts across the organization that primarily deals with the integration of capabilities used by the organization to create value. Chapter 2 offers more detail to support the identification of these two types of alignment.

The focus of this dissertation is on the second type of alignment. Hence, I will briefly discuss early research on it here. Miner et al. (1994) investigated one type of horizontal alignment, i.e. the congruence between two capabilities of the organization. They defined it to be the degree to which the strategy and structure of one capability is consistent with the strategy and structure of another capability. In other words, the more coordinated and integrated the two capabilities were, the greater the alignment for the organization. It was
argued that highly coordinated and integrated capabilities resulted in stronger performance than those capabilities, lacking coordination and integration. To maximize the potential benefit from these capabilities, organizations needed to configure and coordinate their basket of capabilities (Winter, 2002). Configuration and coordination are discussed in Chapter 2 as key elements of capability alignment. Given its focus on how well capabilities work with one another, when alignment is discussed in this study, the focus is on what Kathuria et al. (2007) call “horizontal integration.” As stated earlier, Chapter 2 offers more insight into horizontal integration and its relevance to this dissertation.

Statement of Problem

As described earlier, DC is a key construct in research that offers the potential to help describe organizational change. We have a reasonably comprehensive answer to the question, “what are DCs?” Although the proliferation of DC research is apparent, there remain unresolved issues that plague the research stream. Significant prior research has focused on DCs as a source of sustainable competitive advantage (Teece et al., 1997; Helfat et al., 2007; O’Reilly & Tushman, 2008). In doing so, these efforts have recognized the existence of specific organizational processes and managerial processes associated with DCs. While both organizational processes and managerial processes are discussed in the literature, there is an imbalance in the treatment of managerial processes that require more attention. For the purposes of this study, organizational processes and managerial processes are defined as distinct processes that make up dynamic capabilities. By defining each type of process, a more comprehensive account of the DC construct may advance our understanding of how DCs
influence ordinary capabilities. To this end, the problems addressed in this dissertation are
two-fold. First, a closer examination of the DC construct reveals deficiencies in the
development of managerial processes often discussed, but not well researched in the literature.
This gap makes it difficult to assess the influence DCs have on ordinary capability alignment.

Second, without a comprehensive understanding of both components of the DC construct, the field has struggled to advance an agenda of the practical implications of DCs. As a result, our understanding of their impacts on ordinary capabilities and their alignment is limited. This study will illustrate how conceptualizing the managerial processes of DCs will offer greater insight into ordinary capabilities and their alignment. Given that one of the purposes of this dissertation is to better understand how dynamic capabilities influence the alignment of ordinary capabilities, a closer examination of ordinary capability alignment is needed. More specifically, the underlying dimensions of the alignment construct require investigation. However, before we can begin to assess those relationships, a more in-depth treatment of the DC construct is needed. The section to follow begins by describing the components of DCs and how the components are presented in the literature.

Components of DCs Found in the Literature

The literature offers a reasonably well-accepted definition of DCs and delineates the key underlying components of DCs. More specifically, Eisenhardt and Martin (2000) and Teece (2007) identify two characteristics of DCs: organizational processes and managerial processes. For example, beginning on page 1320, Teece (2007) states “Not only must the innovating enterprise spend heavily on R &D and assiduously develop and protect its intellectual property:
it must also generate and implement the complementary organizational and managerial innovations needed to achieve and sustain competitiveness.” While this observation stops short of directly referring to the “organizational and managerial innovations” as processes, the statement describes how both organizational and managerial innovations are needed to create competitive advantage. The notion of needing both is a foundational tenet of the DCs framework. Eisenhardt and Martin (2000: 1107) defined DCs, in part as “the organizational and strategic routines by which firms achieve new resource configurations,” which also alludes to the distinct differences between “organizational and strategic routines.” Regardless of the term used, “innovations” (Teece) or “routines” (Eisenhardt and Martin, 2000), the literature offers consistent support for a separation of organizational and managerial aspects in the context of achieving a competitive advantage. In this study, organizational processes are defined as those processes that allow the organization to sense, seize, and reconfigure capabilities that enable it to adapt to changes in the environment. These processes do not describe how managers orchestrate changes. Instead, these processes identify the broad components necessary to map out what needs to change, but not how the change occurs. Borrowing from Adner and Helfat (2003) and Kor and Mesko (2013), who defined dynamic managerial capabilities as those capabilities that allow managers to get things done, these managerial capabilities stem from the beliefs and values systems that managers subscribe to in hopes of achieving objectives. Rooted in dominant logic, the tenets of dynamic managerial capabilities outline how managers could perceive environmental and firm specific stimuli that drive decision-making. This illustration digresses from previous works by describing organizational processes as those that identify “what” needs to change. Managerial processes,
on the other hand, identify “how” those changes will occur. More details of this digression are presented in Chapter 2.

Prior research offers significant contributions on organizational processes, but unfortunately, my review of the literature revealed that minimal attention has been paid to managerial processes of DCs. As a result, currently scholars do not have a clear understanding of the managerial processes of DCs. To achieve a fuller description of DCs, scholars must develop a better understanding of these managerial processes. That is, researchers must find adequate answers to two critical questions: (1) what are the managerial processes of DCs? And (2) What are the underlying elements of each of the identified managerial processes?

Relationship between Components of DCs and Ordinary Capabilities

Prior research provides an indication on how organizational processes and managerial processes of DCs work together to influence competitive advantage. Sirmon, Hitt, Ireland, and Gilbert (2011) and Easterby-Smith, Lyles, and Peteraf (2009) argue that managerial processes influence organizational processes by affecting the degree to which the organization can realize the benefits derived from proposed changes. For instance, an organization may be able to identify a new market opportunity based on its ability to scan the environment and sense an opportunity. However, if the organization possesses inferior managerial processes, the organization will struggle to bring the opportunity to fruition. On the other hand, if the organization has superior levels of the same, the organization may be better prepared to seize the opportunity and realize its benefits.
Helfat et al. (2007) use the term “evolutionary fitness” to describe how dynamic capabilities allow organizations to earn a living. In their view, evolutionary fitness describes how well the organization is able to match its ordinary capabilities with the environment. Hence, from their perspective, managerial processes of DCs influence the outcome or “matching” with the environment. That is, better managerial processes result in a more appropriate match or what I will refer to as a higher level of alignment between ordinary capabilities and the environment. The outcome from this alignment is stronger organizational performance, as capabilities have been changed to help the organization perform in a given environment.

Sirmon, Hitt, and Ireland (2007) described how process and sub-process synchronization are needed to create value. The pursuit of fit requires the use of managerial processes to prescribe the degree of fit achieved by the organization. Given this, I argue that managerial processes of DCs serve as moderators of the relationship between organizational processes of DCs and select ordinary capability alignments. A pictorial representation of this relationship is offered in Figure 1.
Toward a Clearer Articulation of DCs

The aim of DC research is to understand how organizations create, integrate, reconfigure, and use internal and external resources to respond to environmental change (Teece, 2012). Given this charge, the field has progressed by offering two types of processes of DCs: organizational processes and managerial processes. However, researchers have not yet explored the “micro-foundations” of the managerial processes. Table 1 illustrates this point. While it displays multiple well-cited works on the managerial processes of DCs, the limited number of articles identified here illustrates how wide the gap is between research on organizational processes of DCs and managerial processes of DCs. Barreto (2010) reviewed publications between 1997 and 2007 and identified 38 articles that focused on dynamic capabilities in eight leading management journals. Peteraf, Stefano and Verona (2013) conducted a historiographic investigation and identified the 61 most-cited articles published between 1990 and 2009. To supplement these recent reviews, I identified a third list of relevant articles drawn from the 2010-2013 period that was not covered in prior reviews. I then examined each article in the three lists, and identified 20 articles that addressed dynamic capabilities “content” (i.e., research that characterized the organizational processes and/or the managerial processes of dynamic capabilities). Seventeen of these articles addressed organizational processes. Only nine articles addressed managerial processes, confirming the observation that the focus of prior research is biased toward the organizational processes of dynamic capabilities. Further, research on the managerial processes of dynamic capabilities is

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in an early stage of development, as noted by the limited number of articles on the subject.

Table 1 provides details on the 20 selected articles and illustrates the imbalance in the research on the organizational processes and managerial processes dimensions of dynamic capabilities. I contend such imbalance may have constrained researchers from offering an appropriately specified operationalization of the dynamic capabilities construct. While the list below is not exhaustive, it is representative of the paucity in research on managerial processes of dynamic capabilities. Several of the seminal works listed in the table contain both organizational and managerial processes. This has limited the ability of researchers to offer a comprehensive articulation of the DCs construct that embodies both organizational processes and managerial processes. To supplement existing organizational process-oriented research, this dissertation will develop and test measures of managerial processes to offer a reconceptualized perspective of DCs.

Statement of Purpose

This investigation departs from past research, which has viewed DCs as clusters of organizational processes and has focused on how these processes can be a source of competitive advantage for the organization. Instead, the focus in this study is on the fundamental role of DC in organizations – i.e., its ability to orchestrate organizational change. This change in research focus allows me to frame the problem as one of managing change; thereby, allowing me to both investigate the organizational processes and use an appropriate lens to identify and specify the managerial processes of DCs. I will draw on various theoretical perspectives to uncover various managerial processes and explore the elements of each.
Table 1

Selected Publications Addressing Organizational and Managerial Processes in DCs Research

<table>
<thead>
<tr>
<th>Authorship</th>
<th>Year</th>
<th>Type of Study</th>
<th>Research Focus</th>
<th>Addressed Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teece, Pisano and Shuen</td>
<td>1997</td>
<td>Conceptual</td>
<td>Introduction of DC and its composition of organizational and managerial processes</td>
<td>Yes</td>
</tr>
<tr>
<td>Eisenhardt and Martin</td>
<td>2000</td>
<td>Conceptual</td>
<td>Depiction of DCs as “best practices” and briefly discuss how market dynamism may influence DC use to obtain competitive advantage</td>
<td>Yes</td>
</tr>
<tr>
<td>Zollo and Winter</td>
<td>2002</td>
<td>Conceptual</td>
<td>Learning mechanisms that facilitate DC development</td>
<td>Yes</td>
</tr>
<tr>
<td>Rosenbloom</td>
<td>2000</td>
<td>Case Study</td>
<td>The roles in dynamic capability processes to enable change in an organization</td>
<td>Yes</td>
</tr>
<tr>
<td>Makadok</td>
<td>2001</td>
<td>Conceptual</td>
<td>Described mechanisms for pursuing economic rents</td>
<td>Yes</td>
</tr>
<tr>
<td>Galunic and Eisenhardt</td>
<td>2001</td>
<td>Empirical</td>
<td>Discusses the “rules” that enable adaptive behavior</td>
<td>Yes</td>
</tr>
<tr>
<td>Zott</td>
<td>2003</td>
<td>Simulation</td>
<td>Details the linkage of DCs to performance variation across firms with similar capabilities</td>
<td>Yes</td>
</tr>
<tr>
<td>Benner and Tushman</td>
<td>2003</td>
<td>Conceptual</td>
<td>The effects of process management on DCs</td>
<td>Yes Yes</td>
</tr>
<tr>
<td>Pil and Cohen</td>
<td>2006</td>
<td>Conceptual</td>
<td>Modularity and how it aids in DC development</td>
<td>Yes</td>
</tr>
<tr>
<td>Lavie</td>
<td>2006</td>
<td>Conceptual</td>
<td>Reconfiguration mechanisms that facilitate capability change</td>
<td>Yes Yes</td>
</tr>
<tr>
<td>Helfat et al.</td>
<td>2007</td>
<td>Conceptual</td>
<td>DCs are comprised of organizational and managerial processes</td>
<td>Yes Yes</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Authorship</th>
<th>Year</th>
<th>Type of Study</th>
<th>Research Focus</th>
<th>Addressed Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Teece</td>
<td>2007</td>
<td>Conceptual</td>
<td>Disaggregation of organizational processes to identify possible areas that require change</td>
<td>Yes</td>
</tr>
<tr>
<td>13 Danneels</td>
<td>2008</td>
<td>Empirical</td>
<td>Describe how managerial approaches to organizational processes influence performance</td>
<td>Yes Yes</td>
</tr>
<tr>
<td>14 Sirmon, Hit, Ireland and Gilbert</td>
<td>2011</td>
<td>Conceptual</td>
<td>How resource are orchestrated to create competitive advantage</td>
<td>Yes Yes</td>
</tr>
<tr>
<td>15 Danneels</td>
<td>2010</td>
<td>Case Study</td>
<td>The managerial mechanisms used to facilitate resource alteration</td>
<td>Yes</td>
</tr>
<tr>
<td>16 Helfat and Winter</td>
<td>2011</td>
<td>Conceptual</td>
<td>Draws attention to the blurry lie between dynamic capabilities and ordinary capabilities</td>
<td>Yes</td>
</tr>
<tr>
<td>17 Pavlou and El Sawy</td>
<td>2011</td>
<td>Empirical</td>
<td>They identify organizational processes of dynamic capabilities</td>
<td>Yes</td>
</tr>
<tr>
<td>18 Protogerou, Caloghirou and Liokas</td>
<td>2011</td>
<td>Empirical</td>
<td>Find an indirect relationship between dynamic capabilities and performance</td>
<td>Yes</td>
</tr>
<tr>
<td>19 Teece</td>
<td>2012</td>
<td>Conceptual</td>
<td>The role of management in the dynamic capability framework</td>
<td>Yes Yes</td>
</tr>
<tr>
<td>20 Kor and Mesko</td>
<td>2013</td>
<td>Conceptual</td>
<td>Antecedents of the managerial architecture of dynamic capabilities</td>
<td>Yes</td>
</tr>
</tbody>
</table>

This study represents a distinct departure from prior thinking, and offers an opportunity to enrich our understanding of the phenomenon by casting the managerial processes of DCs as the moderators of change in the organization. I employ a fresh approach, utilizing an
architectural lens to articulate and expand our understanding of the “DNA” of DCs. Fleshing out the theoretical basis of managerial processes offers a deeper conceptualization of the DC construct. I submit that this approach to theory development offers two valuable insights for researchers. First, it enables the construction of a comprehensive operationalization of the DC construct that exhibits both organizational processes and managerial processes. Second, the development provides finer-grained insights into the underexplored aspects of the managerial processes of DCs by scholars and would be extremely valuable to researchers interested in investigating how the organizational processes of DCs are deployed in practice.

Research Questions

In a recent publication, Lichtenthaler and Muethel (2012) call for research on how managerial processes influence a firm’s innovation capability because factors such as family ownership and size may shape the firm’s appetite for innovation. Further, Pavlou and El Sawy (2011) also call for a better articulation of the building blocks (managerial processes) of DC to enrich our understanding of the phenomenon, because from a practical standpoint, managers still do not know how to build and sustain DCs. One of the foci of this dissertation is on these managerial processes. Hence, my first research question seeks to identify the basic elements that make up the managerial processes of DCs.

Research Question-1: What are the fundamental elements which, taken together, characterize the managerial processes of DCs?

I noted earlier that DC research struggles because of the measurement challenge it faces. Hence, my second research question articulates this opportunity in the literature and highlights the need to identify appropriate ways to measure the managerial processes of DCs.
Identifying measures that are appropriate in the context of organizational change, strategic management and organizational performance will allow for multi-faceted research in areas such as organizational change, strategic flexibility, organizational ambidexterity, and organizational performance.

Research Question-2: How does one measure the managerial processes of DCs?

The third research question addresses a particularly unclear area within the literature - How do DCs influence the alignment of ordinary capabilities? One reason for this absence of clarity is the limited amount of research attention paid to the managerial processes of DCs. Another possible cause of the ambiguity pertains to our limited understanding of capability alignment. As noted earlier, much of the prior literature on alignment dealt with aligning the organization with its environment. This investigation will take a pioneering step to use a comprehensive articulation of DCs (that includes both organizational processes and managerial processes) to examine how DCs influence the “alignment” among ordinary capabilities. In this case, the focus of alignment is internal to the organization and emphasizes how ordinary capabilities are configured and coordinated to achieve a best “fit.”

Research Question-3: How are managerial processes and the organizational processes of DCs employed by organizations to influence ordinary capability alignment?

Chapter Summary

Researchers generally agree that DCs are comprised of organizational processes and managerial processes. While the literature offers ample insights into organizational processes of DCs, discussions on associated managerial processes are absent from the literature. Earlier in the development, I noted that, if the objective is to develop a comprehensive understanding
of DCs, which is useful to both researchers and practitioners, it would need to include both organizational and managerial process components. To fill this research gap, and to provide a useful articulation of the managerial processes, an alternative framing of the DC construct that allows us to explore the use of managerial processes to orchestrate change in the organization is needed. In lieu of offering another organizational process-based investigation, the first objective of this study is to propose new theory that extends our understanding of the managerial processes of DCs.

Second, this study develops a measurement instrument for the managerial processes of DCs. Such an instrument invites future theoretical and empirical work that can continue to investigate the “how,” “who,” and “what” relevant to DC research. Without a comprehensive approach to articulating and measuring the managerial processes of DCs, the field remains destined for insightful, yet limited, progress.

The third objective of this dissertation is to offer insight into the relationships between two types of organizational capabilities by examining how the managerial processes and the organizational process of DCs work together to influence the “alignment” of ordinary capabilities. My approach departs from prior work in two significant ways. First, I offer an operationalization of DCs that is anchored in theory which is a more comprehensive account of organizational change phenomenon (i.e., it includes both organizational processes and managerial processes). Second, I depart from prior empirical work found in the DC literature wherein the dependent variable was organizational performance. Shifting the focus away from organizational performance to organizational change via ordinary capability alignment, allows me to more closely examine the influence of the DCs on the ordinary capabilities of the firm.
which, researchers (e.g., Teece et al., 1997; Eisenhardt and Martin, 2000) claim is the *raison d’être* for DCs.

Prior literature has established a direct linkage between the organizational processes of DCs and ordinary capabilities (see Pavlou and El Sawy, 2011). However, it remains unclear how these relationships may change in the presence of the managerial processes of DCs. This investigation will propose and test the combined effect of managerial processes and organizational processes of DCs on the alignment between ordinary capabilities.

One spin-off of this dissertation is the ability to inform both evolutionary change theory and strategic management theory. In doing so, this dissertation will help sustain the construction of stronger “bridges” between organization scholars and strategic management scholars (see Lewin, et al. 2011). Presently, the perception of the linkage between these camps is weak due to the idiosyncratic preferences of each group of researchers (Argyres, Felin, Foss, & Zenger, 2012).

**Study Presentation**

Chapter 2 provides a research model and review of the literature on DCs. An introduction of relevant theories from organizational theory, organizational design, and architecture follows to provide a different context for DC research. Relationships between established organizational process dimensions and newly developed architectural elements materialize. More specifically, I will introduce the architectural elements used to extrapolate the managerial processes, as well as those for organizational processes of DCs.
In Chapter 3, a research design and method is offered to test the proposed hypotheses transpires. First, an overview of the Chapter 1s presented. Next, a description of the operationalization of study variables is offered. Then, a discussion of the methodology for the pilot studies is presented. Pilot study findings and results will help to refine the methodology for the main study.
CHAPTER 2
LITERATURE REVIEW

Introduction

Chapter 2 describes relevant literature and offers hypotheses that address the research questions outlined in Chapter 1. The developments presented in this chapter utilize prior perspectives to extend the state-of-the-art operationalization of dynamic capabilities (DCs) to define the managerial processes of DCs. I then use this extension to assess the relationship between the more comprehensive dynamic capability (DC) construct and alignment between ordinary capabilities of the firm.

The chapter begins with a review of theoretical frameworks that are used in this dissertation. Next, to address Research Question 1, an architectural perspective is employed to conceptualize the types of managerial processes of DCs. Each managerial mechanism is then carefully decomposed to arrive at its underlying dimensions. The dimensions are subsequently operationalized, thereby addressing Research Question 2. Finally, based on a collective understanding gleaned from the development, hypothesized relationships between the two components (organizational processes and managerial processes) of DCs and the alignment of ordinary capabilities are offered. By doing this, I address Research Question 3.

The Approach

Prior works by Teece et al. (1997), Eisenhardt and Martin (2000), Helfat et al. (2007), and Teece (2000, 2007, 2012) provide important contributions to our understanding of DCs by conceptualizing the existence of two distinct components - organizational processes and
managerial processes- that constitute the DC construct. However, the research focus of these and other scholarly contributions have primarily been on the organizational processes of DCs. Hence, my intent is to go beyond investigations offering organizational process-based articulations of the phenomenon. Instead, this investigation offers theoretical extensions by offering insights on the managerial processes of DCs.

Before attempting to answer the proposed research questions, a more detailed discussion of relevant topics is necessary. I will begin by borrowing from Chapter 1 to offer an overview of how organizations pursue alignment with their environments. This insight helps frame the development and offer guidance to extract three types of managerial processes of DCs. An architectural lens is applied to enable the extraction. Finally, appropriate theoretical developments are undertaken to offer testable hypotheses on proposed relationships between DCs and ordinary capabilities of an organization.

An Overview of Relevant Perspectives

Managerial Perspective

Researchers have noted that organizational change can improve performance if the organization appropriately incorporates the changes into its set of routines and competencies (Haveman, 1992). Some organizations seem to execute change better than others, which raises the important question regarding why some organizations struggle when faced with evolutionary change? One explanation can be found in the choices managers make. Researchers have argued that the differences in the success or failure of organizations in executing change lies in the strategic choices that managers make. Child (1972) noted that
organizational leaders must make good strategic choices to successfully guide an organization through change. Oliver (1991) contended that organizations have options to choose from when responding to institutional pressures and must choose wisely from among them. In general, the strategic choice perspective suggests that leadership and the associated managerial processes (Astley & Van de Ven, 1983) are critical to successfully execute organizational change. Finally, Child (1997) suggests that strategic choices are often the outcome of underlying political processes in the organization. Organizational leaders use/wield power to make strategic choices in areas important to the organization.

Others, such as Bradley, Aldrich, Shepherd, and Wiklund (2011), posit that the answer to this question could lie in the structural orientation of the organization. For instance, they argue that the organization’s position in the corporate structure (i.e. independent or subsidiary) plays a role in the organization’s ability to effectively manage capabilities when experiencing an environmental jolt. They found that independent organizations are better at managing their capabilities in such situations than are their subsidiary counterparts, which suggests that, independent organizations have stronger control over creating and changing capabilities. The article calls attention to the importance of structural/governance mechanisms that influence the ability of management to execute changes to the organization’s capabilities.

In summary, the role that managers and leaders play in the reconfiguration and realignment of the ordinary capabilities of an organization is relevant. By extension, the strategic choice theory also suggests that DCs may offer organizational leaders multiple change options. In addition, the strategic choices of managers and leaders assume an organizational goal of achieving “fit” or “alignment” between the firm and its environment. Therefore, these
choices suggest that leaders must determine how to implement changes that result in value
creating activities, resulting in an optimal alignment. The next section offers additional context
on organizational change via the capabilities perspective.

The Capabilities Perspective

Configuration theory argues that an organization pursues alignment in an attempt to
obtain the “proper fit” between organizationally controlled imperatives and its environment
(Randolph and Dess, 1984). The capabilities perspective extends this argument by suggesting
that firms obtain a “proper fit” by adjusting their capabilities. That is, when faced with changes
in the environment, or changes in management’s imperatives, organizations examine their
stocks of capabilities to determine what they have, but equally important, what they do not
have, to address the changes. Organizations use this information to change the configuration
of their capabilities in hopes of dynamically achieving a better fit, both internally and externally
(Venkatraman, 1989). By providing a broad framework and an explanation of how firms enact
change, capability-based research has helped infuse dynamism into prior research anchored in
the IO Economic perspective and the Resource Based View of the firm.

The capabilities perspective posits that the ability to alter its capabilities allows the
organization to evolve in unique ways. For example, some organizations, such as 3M, possess
strong exploration skills that facilitate new opportunities (von Hippel, Thomke, & Sonnack,
1999). Other organizations, like GE, have strong exploitation skills to improve existing products
and services that appeal within the markets it serves (Harry & Schroeder, 2000). Both 3M and
GE possess unique, but different, abilities to continuously adapt to changes in the environment.
Capabilities are present in all organizations. However, this does not necessarily imply that all firms can create significant competitive advantage. For example, Eisenhardt and Martin (2000) argued that significant competitive advantage results from the unique combinations of capabilities, not just the existence of capabilities in the firm. Viewed through a configurational lens, changes in structure, strategy and leadership result in changes to the capabilities that ultimately result in a competitive advantage. The question is then, how do firms alter their various value creating capabilities and align them in unique ways that, as noted by Black and Boal (1994), are difficult to duplicate? The literature argues that this is achieved by employing unique capabilities called dynamic capabilities (DCs).

In summary, the managerial and capabilities perspectives offer promising frameworks that allow me to understand and investigate the links between the managerial processes of DCs and ordinary capabilities. However, despite their explanatory power, these theories provide little insights related to the underlying dimensionality of DCs. They do not help address Research Questions 1 and 2, which require a different framework. For these research questions, I must employ a managerial focus that can help me identify the specific processes used to create and deploy DCs. In the sections that follow, an architectural lens is used to identify these specific dimensions. I begin by providing an overview of the nature of organizational capabilities. Next, I discuss the state-of-the art operationalization of DCs and then make the case for an architecture-based operationalization of managerial processes of DCs that will help move the field forward.
The Nature of Organizational Capabilities

Capabilities refer to a collection of routines and processes that an organization assembles to create and deploy its resources, and achieve a desired end (Amit & Schoemaker, 1993). Given this evolution over time, capabilities are deemed to be embedded in the organization (Nelson and Winter, 1982). Helfat and Peteraf (2003) provide valuable insight when they note that capabilities evolve over time through the complex interactions among resources (i.e., organizational processes) and the choices made by business executives (i.e., managerial processes). As will be noted later, other scholars have supported the argument that a capability is comprised of two distinct types of processes – organizational and managerial, which in tandem create competitive advantage.

Research on organizational capabilities brought about healthy debate regarding the existence of multiple types of organizational capabilities. For instance, Teece et al. (1997) contends that DCs are higher-order capabilities used to change lower-order capabilities. This is consistent with Collis’ (1994) conceptualization, which identified capabilities at a functional, dynamic, and metaphysical level; thereby, indirectly classifying organizational capabilities into a hierarchy. Winter (2003) extended the discussion by identifying and establishing a hierarchy of capabilities consisting of: zero-order, first-order, and second-order capabilities. The distinction among capability types is often blurred in prior research. For example, zero-order and first-order capabilities are at times, correctly or incorrectly, described synonymously. In this dissertation, I support the predominant theoretical view found in the literature that first-order capabilities are distinct from zero-order capabilities.
In general, researchers have identified three types of organizational capabilities. Zero-order capabilities are those capabilities that enable the organization to compete in the marketplace. For example, United Parcel Service (UPS) possesses operational capabilities that allow the organization to run one of the most efficient package delivery businesses in the world. This zero-order capability creates value for customers and serves as the basis for the overall UPS business model.

First-order capabilities facilitate changes in, and exploitation of, zero-order capabilities (Teece et al., 1997). Hence, DCs are often viewed as first-order capabilities. For instance, Apple has strong innovation capabilities, but those capabilities alone are not what pushed Apple to the forefront of customer value creation. Apple’s ability to scan, interpret, and reconfigure those innovation capabilities based on anticipated market changes (i.e., its dynamic capability) creates unique value for which Apple’s customers are willing to pay a premium price.

Second-order capabilities are thought to influence both zero-order and first-order capabilities and usually reside in the upper levels of organizational leadership in the form of tacit knowledge. These capabilities are manifested in managerial preferences and the dominant logic of the organization. For instance, the dominant logic of Jack Welch and his management team during his tenure at GE illustrated the chemistry stemming from tacit knowledge among the leadership team. This chemistry resulted in GE’s relentless pursuit of the number one and two market share positions in the businesses they competed in.

Although there are many proponents of the hierarchical view of capabilities, others disagree. Eisenhardt and Martin (2000) stated that DCs are merely another set of organizational capabilities and that there is no discernible hierarchy of capabilities. They
contend that DCs are a form of organizational resources and may not solely exist to transform zero-order capabilities. Similarly, Drnevich and Kriauciunas (2011) separate ordinary capabilities from DCs and assess the impact of each on relative firm performance. While not directly stated, the research model they employed suggests that there is no hierarchy of capabilities. Finally, Helfat and Winter (2011) state that it is difficult to separate ordinary (zero-order) capabilities from DCs (first-order), which may also hint at the lack of a hierarchy if the two types of capabilities can be viewed as difficult to separate from an empirical standpoint. Understanding these debates provides much-needed context to conceptualize the managerial processes of DCs.

For the purposes of this development, a difference among capabilities is assumed. Figure 1 illustrates the differences as argued by Collis (1994), where zero-order capabilities offer the organization the ability to create value for customers. These capabilities are referred to as ordinary capabilities. Organizations use first-order capabilities to make changes in zero-order capabilities. Finally, second-order capabilities offer “metaphysical strategic insights,” as noted by Collis (1994: 145). Second-order capabilities speak to an organizations’ overall dominant logic. The capability figure (see Figure 2) suggests that each level of capability influences organizational competences, but stops short of referring to zero, first, and second order capabilities as a hierarchy. In this dissertation, the focus is on the difference in these capabilities and not on a hierarchy per se as described by Collis (1994). More specifically, this investigation examines the role of DCs and their ability to influence changes in the relationships among ordinary capabilities. Peteraf et al. (2013: 1389) describe the differences in how DCs are viewed via Teece et al. (1997) and Eisenhardt and Martin (2000) as “the elephant in the room of
DCs.” More specifically, Peteraf et al. (2013) discuss the differences of these two accounts, as it relates to the boundary conditions of DCs. Utilizing the approach taken in this dissertation neither confirms nor denies the existence of a hierarchy, but instead focuses on the differences in the levels of capabilities and how organizations seek alignment among its ordinary capabilities using DCs.

Figure 2
How Capabilities Result in Organizational Competence

What are DCs?

More than a decade ago, Eisenhardt and Martin (2000) asked the question, “What are DCs?” My review of the literature suggests that today researchers have a reasonably well accepted definition of the organizational processes of DCs. Dynamic capabilities have been conceptualized as capabilities that are created and deployed to transform and reconfigure
ordinary (zero-order) capabilities of the organization (Winter, 2003). In addition, researchers have noted that DCs can be described in terms of their organizational processes and managerial processes (see Teece, 2007, 2012; Ambrosini et al., 2009; Helfat et al., 2007) that are believed to be context specific (Danneels, 2010). This may explain why organizations can take different paths yet possibly end up with similar dynamic capabilities. Alternatively, organizations can possess similar capability (Collis, 1994) and yet perform differently. Zollo and Winter (2002) suggest that a possible explanation for such differences could rest in the temporal dynamics of the organization’s capability. Finally, scholars agree that the process of building ordinary capabilities takes time and investment (Teece, 2012; Helfat & Winter, 2011; Helfat et al., 2007; Eisenhardt & Martin, 2000; Winter, 2003). With this understanding, it is clear that the development of DCs is organization specific. While different organizations can end up with similar capabilities, the path that each organization follows to get there can be different.

The State-of-the-art on DC Research

Helfat et al. (2007) noted that DCs are process-oriented phenomena consisting of organizational processes and managerial processes. Much research has been conducted on the organizational processes of DCs. Researchers have identified three types of organizational processes: sensing, seizing, and reconfiguring (Teece, 2007; O’Reilly & Tushman, 2008; Kay, 2010; Helfat & Peteraf, 2003). Zott (2003) referred to similar conceptualizations of DC processes, but called them variation, selection, and retention. Researchers have also posited that the three underlying processes of DCs are unique and discrete (e.g., Helfat et al., 2007). Teece’s (2007) work provides skills-based descriptions of the underlying organizational
processes. Lewin, Massini, and Peeters (2011) advance our understanding of one type of DC – absorptive capacity. More specifically, they offer a discussion on the internal and the external meta-routines of absorptive capacity. In summary, researchers have adequately established the existence of three processes of DCs that explain how the organization identifies, selects, and pursues opportunities. While these works and others highlight the breadth and depth of DC organizational process research, it also points to the opportunity for additional work on the managerial processes of DCs.

Unfortunately, we do not have a clear understanding of the managerial processes of DCs. Work by Eisenhardt and Martin (2000) and Helfat et al. (2007) suggest that DC research would progress more rapidly if we conducted managerial process-focused research that could be used to enhance our understanding of DCs. Adner and Helfat (2003) took steps in this direction by identifying three underpinnings of dynamic managerial capabilities: 1) managerial human capital, 2) managerial social capital, and 3) managerial cognition. They defined managerial human capital as the specific knowledge and skills managers possess; managerial social capital as the specific access managers have to resources via systems and networks; and, managerial cognition as the beliefs and values of managers that influence decisions (Prahalad and Bettis, 1986). Kor and Mesko (2013) use these underpinnings to theorize how they influence the dominant logic of CEOs and top management teams. These works provide a foundation to further examine the managerial processes of DCs and describe the significance of managers and the processes they use to accomplish work. Yet, we have only begun to examine how such processes are a critical component of the DC construct. As a result, more work is
needed in the area of managerial processes to offer further explanation of their roles in DCs. In
the next section, I review on the current state of DCs research.

The Organizational Processes of DCs

Teece (2007) and other researchers have theorized that three types of organizational
processes of DCs exist: sensing, seizing, and reconfiguring (see Figure 3). Sensing refers to the
identification and assessment of an opportunity. Seizing pertains to mobilization of resources
by the organization to create value. Reconfiguring is the ability to renew or continue the use of
the capability.

Figure 3
Organizational Processes of DCs (Derived from Teece (2007))

Gaps in DC Research

While research on the classification and organizational process-based articulation of DC
has offered valuable and insightful contributions, these contributions do not help us adequately
characterize the full conceptualization of DCs for research purposes. What has impeded
progress of the field is the absence of an appropriate articulation of the managerial processes
of DCs. Researchers must uncover the core managerial processes used by organizations to
create and deploy the organizational processes of DCs. Yet, very little research exists to further our understanding of these managerial processes. The next section attempts to address this gap by first offering an architectural conceptualization of the managerial processes of DCs. Then, I continue the development to tease out the dimensionality of each identified managerial process.

Toward a Comprehensive Operationalization of DCs

As noted in Chapter 1, DC research can better serve our need to understand organizational change if scholars can find answers to two critical questions regarding its managerial processes: (1) What are the managerial processes of a DC? and (2) What are the underlying dimensions of each of the identified managerial processes?

What are the managerial processes of a DC? Our understanding of how DCs are created and deployed, remains under-developed. As Helfat et al., (2007) suggested there are managerial processes underlying the changes that stem from the use of DCs. Identifying and describing elements of these foundational processes is a precursor to extending the field in ways that more accurately recognize, describe and study DCs. However, current articulations do not paint a complete picture. For instance, research and development (R&D) (Narayanan et al., 2009), new product development (NPD) (Eisenhardt & Martin, 2000), and organizational learning (Zollo & Winter, 2002) have all been identified as DCs of organizations. Yet, these studies examine the phenomenon through an organizational-process lens. What is missing from these and other accounts is a theoretical narrative on the managerial processes of DCs.

Adner and Helfat (2003: 1012) refer to dynamic managerial capabilities as a “direct analogy to more general organizational ‘dynamic capabilities’ offered by Teece et al., (1997).
These delineations between organizational and managerial capabilities are foundational because they illustrate the differences between the two types of capabilities. Building upon this notion, this study attempts to operationalize the processes associated with these managerial capabilities. For DCs to exist, they must be repeatable (Helfat & Peteraf, 2009; Teece, 2012), suggesting there is a set of managerial process at work to enable the repetition (Helfat et al., 2007; Teece, 2000; Teece, 2012). However, these studies do not offer detailed descriptions of these processes. More recent studies by Helfat and Winter (2011), and Drnevich, and Kriauciunas (2011) acknowledge the separation of ordinary capabilities and DCs, but they too stop short of providing details on these managerial processes. Despite the existence of some research on the managerial processes of the DCs (e.g., Benner and Tushman, 2003; Pil and Cohen, 2006; Lavie, 2006; and Danneels, 2008) phenomenon, the black box of the managerial processes of DCs remains shut. Obviously, our cumulative understanding of DCs presents unique challenges for future research. To improve the clarity and the robustness of future research that focuses on the “how” question, the building blocks or foundational elements of DCs so to speak, must be delineated and carefully articulated.

What are the underlying dimensions of managerial processes? To undertake such an exercise, we must identify specific areas of organizational activity that are involved in the managerial processes of DCs. Building upon the foundational work of Adner and Helfat (2003) and the more recent works of Kor and Mesko (2013), we can conceptualize managerial processes of DCs as having elements that describe managerial beliefs and values as well as the manager’s access to and use of systems to orchestrate change. If we conceptualize capabilities (dynamic or otherwise) to consist of processes, structures, and systems (Nadler, Shaw, Walton,
& Associates, 1995), then prior work on DCs has spoken to the “organizational process” side of DCs. However, little work has examined the role that structures and systems play in the managerial processes of DCs. An exception is the work by Teece (2007), which provides insight into how systems influence one of the three organizational processes of DCs. However, this development stops short of offering an articulation of the managerial processes embedded in a DC. In a later piece, Teece (2012) acknowledges this shortcoming in the literature and suggests that future research must address the managerial processes of DCs. Thus, to advance our understanding of this phenomenon, researchers need a different approach to explicate the dimensionality of these managerial processes. I will propose one such approach in this dissertation.

Introducing the Organizational Architecture Perspective

Managerial Processes through an Architectural Lens

A comprehensive and succinct description of the managerial processes of DCs is required to reconceptualize the DCs construct to help move the field forward. To achieve this goal, researchers may need to view DCs differently. This section provides the rationale for applying an alternate theoretical perspective (architectural) to address gaps in the literature. An architectural lens addresses one way to operationalize the managerial processes of DCs. An architectural lens offers a well-defined, disciplined approach to extrapolate meaning, form, and function from its target. However, an architectural lens is more than the science of designing and constructing. From an organizational perspective, architecture represents the “way of doing work” (Nadler, Gerstein, Shaw and Associates, 1995). It provides a framework to
characterize the managerial process associated with value-creation in an organization. Hence, the architectural lens can be used to view managerial processes involved in the creation and deployment of DCs. The next section provides an overview of the historical roots and theoretical underpinnings of the architectural perspective leading up to its application in this dissertation to operationalize the managerial processes of DCs.

What is Architecture?

Architecture refers to an “object” in terms of its meaning, form, and function. This classification of architectural dimensions dates back to the early work of Vitruvius in 30 BC. Vitruvius, considered by many as the father of architecture, noted that, “Architecture depends on order, arrangement, eurhythmy, symmetry, propriety and economy” (Morgan, 1914, p. 13). In the traditional interpretation, the architecture of an object (e.g., a building) has three elements: (1) Meaning - the beauty, delight, and spirit inherent in the object, (2) Form - the shape, structure and substance of the object, and (3) Function - the activity, commodity, and the context of the object.

Organizational Architecture

When the “object” of interest is an organization or one of its components, rather than a static entity (e.g., a civil structure), one must interpret architecture in terms of the “way of doing work.” As a result, one must redefine its three architectural elements accordingly. Nadler, et al. (1992) defined organizational architecture as “the art of shaping the organizational space to meet human needs and aspirations.” Synthesizing earlier developments
on the dimensionality of architecture and Nadler et al.’s (1992) extension of architectural perspective to the organization, three dimensions of organizational architecture emerge. The strategic dimension describes the meaning, purpose, goals and objectives of the organization. The systems dimension includes the uniquely interconnectedness of organizational processes, routines and tasks that create value. Finally, the execution dimension embodies the contextual elements and governance mechanisms that enable operational functionality.

The Architecture of the Managerial Processes of DCs

Viewed from a systems perspective, an organization is, “embodied in its components, their relationships to each other and to the environment, and the principles guiding its design and evolution” (Maier, Emery, and Hilliard, 2001: 108). Similarly, the DCs literature (e.g., Teece and Pisano, 1997; Eisenhardt and Martin, 2000; Helfat and Peteraf, 2009) view an organization as a basket of capabilities (of which DC is one) that are designed to synergistically work together to deliver value to customers. Hence, employing a capability lens, I argue that the 3-dimensional operationalization of organizational architecture extends to each of the capabilities that make up the “organizational space.” In support of this extension, there is evidence of the use of the architectural lens to operationalize some managerial aspects (e.g., modularity) of organizational capabilities (e.g., Ethiraj & Levinthal, 2004; Worren, Moore, & Cardona, 2002; Galunic & Eisenhardt, 2001; and Schilling, 2000). Hence, extrapolating from prior research, I posit that the architecture of the managerial processes of DCs consists of three specific dimensions: the strategic dimension, the systems dimension, and the execution dimension. Provided below is a brief description of the three managerial processes of DCs. My
development for each dimension will begin with an example drawn from the traditional architecture literature. I will then apply the underlying concepts to the organizational context and finally drill down to extract its meaning in the context of the managerial processes of DCs.

The Managerial Processes of DCs

*The Strategic Dimension: Strategic Rationale*

Cameron (2003) describes how architectural design contributes to an object’s transformation. In Cameron’s illustration, the object was an academic building. Before the architect began the project, he deemed it necessary to articulate the “institutional values and motives” of the academic unit that would instill meaning in the design of the building (Cameron, 2003: 90). In an organizational context, the underlying logic that captures value for the organization is represented in the strategic rationale that determines how it will best use a capability (Fjeldstad, Snow, Miles, & Lettl, 2012; Jacobides, 2010). In a similar vein, I argue that the strategic dimension of the managerial processes of DCs is characterized by the strategic rationale for the creation and deployment of DCs. Hence, the management process of “setting and abiding by” the strategic rationale provides the motive and purpose for creating and deploying organizational processes of DCs.

*The Systems Dimension: Systems Integration*

In his example, Cameron (2003) highlighted the imperative to fit a new academic building to the surrounding community. As a member of the community, the relational ties of the new structure with the community begins with a visual fit, followed by congruency with the
role it plays in the greater community. I contend that, in Cameron’s example, the relationships between agents and the contracts that formalize the connections can encompass a systems view of how the new structure’s capability fits and works in the grand scheme of the community. To extend this logic to the organizational context I borrow from Simon’s (1962) view of an organization as an agglomeration of complex sub-systems. Given the intricacies of an organization, it becomes essential to understand the integration of each complex organizational sub-system and how each serves the greater good of the whole. Systems integration describes the hierarchy of relationships and interactions pertaining to the sub-system’s development and use (Gavetti, 2005). Viewing DCs as the organizational “sub-system,” Systems Integration reflects the managerial process that shapes the unique interconnectivity of resources and routines that result in the creation and deployment of organizational processes of DCs.

*The Execution Dimension: Governance Structure*

The development and use of DCs consume critical organizational resources. Therefore, it is necessary to ensure effective use of these resources. A governance structure formally specifies the principal-agent relationships needed to create and deploy DCs. Providing an environment that outlines the rules or contract design (Argyres & Mayer, 2007) and incentives (Siegel & Larson, 2009) used to structure the principal-agent relationships, makes relationship dependencies transparent. Hence, the use of a governance structure is necessary to manage tasks and optimize the contributions (Lepak & Snell, 1999) of the DCs. Without a governance structure, the complex sub-system will likely spiral out of control and change efforts will be
futile (Hannan & Freeman, 1984). Governance Structure represents the managerial process that must exist to maintain stability of the organizational processes and to provide appropriate guidance for the sequencing and execution of the organizational processes of DCs.

**Operationalizing the Managerial Processes of DCs**

In the following section, I expand the discussion on the three components of managerial processes identified in the previous section. The primary purpose in this section is to further explore the dimensionality of each managerial process.

**Strategic Rationale**

Organizations are concerned with the optimal allocation of resources (Simon, 1962) and the formation of ordinary capabilities. As Penrose (1959) observed, organizations have a tendency to grow in the direction of their (ordinary) capabilities. Stated differently, organizations benefit from, or are constrained by, how they develop these capabilities. Since DCs enable such development or change, in ordinary capabilities, the strategic rationale for their existence should be closely linked to that for the ordinary capability. Drawing on the contributions of Borys and Jemison (1989), strategic rationale parallels their development of hybrids in strategic alliances where they describe how purpose, value creation, and stability mechanisms (performance-linked goals) led to alternative strategic alliance formations. While not directly specifying the dimensions of strategic rationale, a perspective taken from Weick, Sutcliffe, and Obstfeld (2005) portrays organizational sense making as the foundation, supported by purpose, values, goals, and experiences, which guides future decisions of the
organization. Building on these observations and borrowing from Fayol (1949) and the more recent work of Galunic and Eisenhardt (2001), I posit that the strategic rationale construct consists of three dimensions - guiding principles, underlying logic for value creation, and goal directed activities.

**Guiding Principles**

The strategic rationale for creating and deploying DCs is driven by the need to influence ordinary capabilities of the organizations and provide alternate rent-capture options. Jacobides (2010) posits that executives should focus on these value-generating capabilities by creating “playscripts” that provide the rules and emphasize the interconnectedness of actors needed to facilitate change. These playscripts depict the underlying guiding principles that foster coherence, growth, and change (Avermaete, 2005) and provide the foundation for creating and deploying DCs.

**Underlying Logic for Value Creation**

Guiding principles are important. However, they are necessary, but not sufficient to move the organization closer to its overall objective. More is needed to translate those principles into meaningful, executable activities in order to successfully create and deploy the targeted DCs. Specifically, the strategic rationale must clearly establish the underlying logic for value creation that DCs are intended to influence (Jacobides, 2010). Much like a compass, this logic influences the configuration and use of the DCs. Without guiding principles and
underlying logic, the resulting organizational impact of DCs will likely be sub-optimal or misguided.

*Goal-Directed Activities*

Goals set the tone for the development of the DCs. As the principles and basic logic provide direction, goals provide magnitude toward a direction, by spelling out specific deliverables. *Goal-directed activities consistent with the purpose* (Fjeldstad et al., 2012) drive alignment and coherence that ultimately facilitates timely and adequate change of the ordinary capability.

In summary, strategic rationale provides the underlying logic and principles in which the organizational processes of DCs are created and deployed. It serves as a vector to guide the creation and deployment of DC. Guiding principles and value-creation logic describe the direction of the DC vector, while goals represent the magnitude of that vector.

*Systems Integration*

General systems theory helps us understand how complex systems are linked via feedback loops (Forrester, 1961). Anderson (1999) suggests that the more complex an organization, the more difficult it is to describe the intricacies of the organizational system. Because DCs facilitate change in ordinary capabilities, it is understandable that their presence will add to organizational complexity. If we view complexity as a function of organizational structure as suggested by Daft (1992), systems integration emerges as a potential approach to compensate for, or reduce, complexity introduced by DCs. In building my argument for the
underlying dimensions of the systems integration component of a DC, I use the notion of modularity as the “glue” that holds together loosely coupled units (Sanchez & Mahoney, 1996). Then, building on the works of Siggelkow and Rivkin (2005), and Casciaro and Piskorski (2005) I argue that adequate decomposition, specification and framing of the system’s (network’s) interconnected also helps managers address system integration. Third, I borrow from Ethiraj and Levinthal (2004) who argue that modularity can be used to address a key element of systems integration, i.e., system “fitness.” Finally, to combine these three perspectives, I borrowed from Scott and Davis’ (2007) view of a network being specified in terms of centrality, density, and clustering. I use this to suggest that the systems integration component of a DC can be adequately specified in terms of the degree of modularity of the system, the interconnectedness of the principles and agents involved in the process, and the fitness of the system with its context.

Interconnectedness and Degree of Modularity

Systems integration facilitates resource orchestration throughout the organization. By identifying the interconnectedness of principals and agents involved in the creation and deployment of DCs, systems integration deconstructs DCs sub-systems into manageable modules. Anderson (1999) argues that once identified, these modules can represent simplistic schemas that show the interconnectedness of the principles and agents in the system (i.e., the DC). The ability to simplify the schema largely depends on the degree of modularity present. Schilling (2000) stated that modularity might increase the pool of possible configurations, which enhances system flexibility. In addition, a high degree of modularity would suggest that the
systems at work (i.e., the DCs) could quickly be reconfigured with other systems (i.e. the ordinary capabilities) in the organization (Day, 2003).

**Fitness of the System with Context**

The organization’s ability to readily adapt to environmental changes (Pil and Cohen, 2006) is represented in terms of *fitness of the system with its context*. In addition, effectively “fitting” the DCs to ordinary capabilities helps control the level of overall complexity (Lawrence, Morse, and Fowler, 2005).

In summary, due to its ability to simplify complex organizational configurations, systems integration emerges as a critical architectural dimension in the context of DCs. It not only identifies how the principals and agents are to engage, but also identifies who the actual actors are. On one hand, it underlines the interconnectedness within the system and on the other hand, it helps managers visualize the need for governance and controls (Aoki & Jackson, 2008). Reducing the interconnectedness lowers the complexity in creating and deploying DCs. The resulting system provides an improved foundation to align incentives and to motivate actors who are involved in the creation and deployment of the organizational processes of DCs.

**Governance Structure**

Dess, Lumpkin, and Eisner (2010) suggested that all organizations must implement some type of strategic control. That is, the firm must develop informational (ability to respond to environmental change) and behavioral (balance the organization’s culture, incentive, and boundaries) control mechanisms to manage uncertainty. A synthesis of the literature (Gulati
and Singh, 1998; Argyres and Mayer, 2007; and Siegel and Larson 2009) identified three mechanisms used to configure governance mechanisms - hierarchical controls, contract design and incentive alignment.

Hierarchical Controls

To avoid potential strategic malfeasance resulting from misappropriation, organizations often turn to hierarchical controls to manage unforeseen problems (Burns & Stalker, 1961). Gulati and Singh (1998) described the use of hierarchical controls to manage organizational uncertainty when organizations are faced with alternative contractual choices. In the case of strategic alliances, Gulati and Singh (1998) found that the higher the coordination costs, the more hierarchical the corresponding governance structure. Miller (1993) suggested that outlining the structure of a hierarchy ultimately defines an organization’s reporting relationships and power balances. Thus, hierarchical controls can enforce the compliance needed to create and deploy the organizational processes of DCs.

Contract Design

To govern potential power imbalances (Pfeffer & Salancik, 1978) and manage information exchanges, effective contract design is believed to be of paramount concern (Argyres & Mayer, 2007). Joseph and Ocasio (2012) suggested that a formal collection of interactions (i.e. a contract) is necessary to manage resources and dependencies in a system. They contend that governance channels extend beyond the reach of vertical reporting relationships needed to effectively manage relationships. Without a governance structure, rules
(intraorganizational and interorganizational) are not clear, adding to the very complexity they seek to reduce. Thus, it is necessary to articulate the rules that govern the exchange relationships. Careful articulation of the rules of engagement is often articulated in a contract.

Contracts identify activation triggers for each party in the relationship. In the context of DCs, contracts align the activation triggers with the purpose (i.e., the strategic rationale). These triggers can also specify the interconnectivity (systems integration) needed to create and deploy DCs. An activation trigger is used to initiate the process. Resulting actions are then ratified, implemented, and monitored (Fama & Jensen, 1983) in the context of the overall purpose. Without the establishment of activation triggers, actors have uncertain accountability, which results in weak contract adherence.

Incentive Alignment

Siegel and Larson (2009) found that the use of incentive pay helped Lincoln Electric remain productive in challenging labor markets. The alignment of incentives allowed the firm to readily adapt to changing labor market conditions within a multinational firm. Burkert, Ivens, and Shan (2012) argued that making specific investments into a relationship between a buyer and seller created incentives for both parties to maintain the relationship. When these investments occur, incentives are aligned and each respective party is motivated to act quickly in the best interest of the relationship. As a result, incentive alignment offers the organization flexibility to quickly rearrange control systems and contracts to match the goal-directed activities developed in strategic rationale.
In summary, to manage potential agency issues, a governance structure is needed (Eisenhardt, 1989). Williamson (1975) used transaction costs to describe how principals and agents are structured in a control system (hierarchy), governed by an agreement (contract), which spells out the nature of the relationships (incentive alignment). Extending the transaction cost logic, I borrow from Park (1996) to stress the relevance of these governance structural elements in managing complex systems. While not directly stated, the focus on these elements is consistent with that of Ocasio and Joseph (2005) and their emphasis on the importance of governance systems in managing and deploying organizational resources. Good support is found in the individual case studies from Joseph and Ocasio (2012) (GE) and Gulati (2010) (Cisco) that weighs in on the importance of governance systems in organizational adaption. In other words, governance structure provides management with the controls, motivation, and rewards to drive the appropriate creation and deployment of the organizational processes of DCs.

Summary Findings on the Managerial Processes of DC

The objective of this section was to articulate the managerial processes and to identify the underlying dimensions of each process. Using an architectural lens, three processes of the managerial processes emerged. Later, I describe the strategic rationale (direction and meaning) of DCs. Next, system integration was added to the research conversation as an element necessary to address complexity and information exchange issues between principals and agents. Finally, a discussion of governance structure ensued to address the need to detect
variances and strategically manage processes. Given, the arguments presented in support of the managerial processes of DCs, I propose the following:

**H1:** The managerial processes of DCs are distinctively different from the organizational processes of DCs.

Table 2 summarizes my findings on the underlying dimensions for the managerial processes of DCs. It also provides key sources from which the dimensions stem. A thorough literature review of multiple streams of research yielded those dimensions that appeared most prominently and consistently. However, it is possible other dimensions exist.

**Table 2**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Description</th>
<th>Source</th>
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<tr>
<td><strong>Strategic Rationale</strong></td>
<td>- Principles that foster coherence, growth, &amp; change&lt;br&gt;- Underlying logic that create &amp; capture value&lt;br&gt;- Goal-directed activities consistent with purpose</td>
<td>Avermaete (2005)&lt;br&gt;Jacobides (2010)&lt;br&gt;Fjeldstad et al. (2012)</td>
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**Establishing Relationships Between DCs and Alignment Between Ordinary Capabilities**

This section of the chapter addresses Research Question-3: How are managerial processes and the organizational processes of DCs employed by organizations to influence ordinary capabilities? This question seeks to understand the relationship between the two types of capabilities that exist in an organization. Hence, before an in-depth discussion of the
relationship between dynamic and ordinary capabilities can be undertaken, it is necessary to frame the development in the context of the types of DCs and the types of ordinary capabilities found in the literature.

A Typology of DCs

Ambrosini et al. (2009) identified three types of DCs: incremental, renewing, and regenerative. Ambrosini et al. (2009) argue that while all three types of DCs are designed to affect the ordinary capabilities of an organization, each serves a unique purpose. According to the authors, the differences lie in the amount of change that each type of DC can inject in the organization, where those changes occur (inside the organization, at the boundary, or external to the organization), and the environmental state in which the firm is a part. In such a conceptualization, incremental DCs refer to capabilities that focus on continuous improvement efforts within the organization. These DCs create incremental changes in ordinary capabilities that stem from continuous observation of the fit between the ordinary capabilities. Renewing DCs are different from incremental DCs in that they alter the organization’s ordinary capability base (Ambrosini et al., 2009; Helfat et al., 2007; Eisenhardt & Martin, 2000). Both incremental DCs and renewing DCs can be viewed as internal to the organization in that they influence capabilities of the organization and are not directly of factors external to the firm.

Regenerative DCs enable the organization to shift away from its current mix of ordinary capabilities. The authors argue that they are most likely exercised in turbulent environments.

3 Note: Each capability “type” would display the requisite organizational process and managerial processes discussed in my earlier development.
Therefore, they require both an external and an internal focus. Figure 4 presents a graphical depiction of these relationships.

Given this three-item typology of DCs, it is likely that changes needed to use external DCs may be different to implement than those changes to use internal DCs. As a result, the impending changes may be more internal (inside of the organization’s capabilities) or external (how the organization positions those capabilities with the environment) to implement the desired changes. We can view incremental and renewing DCs as processes that drive specific and targeted “operational” changes within the organization that address continual but relatively predictable cross-capability alignment needs. Regenerative DCs, on the other hand drive “strategic” changes, which address sporadic and relatively unpredictable changes to ordinary capabilities that have significant and long-term consequences and can be capital intensive. In other words, incremental and renewing DCs are concerned with the alignment and fit of ordinary capabilities within the system, whereas, regenerative DCs deal with broad organization-wide changes such as the development of entirely new capabilities and may occur inside or outside of the organization, as represented by the dissecting dotted line (Ambrosini et al., 2009). In this dissertation, I will focus my efforts on incremental and renewing DCs and I will examine their influence on ordinary capabilities. Since the objective of both incremental and renewing DCs is to ensue alignment among ordinary capabilities (by altering one or more of the attendant ordinary capabilities), I conceptualize these two types of DCs as falling under the umbrella term “internal DCs.”
A Typology of Ordinary Capabilities

As noted earlier in this chapter, ordinary capabilities allow the organization to deliver value to customers. Day (1994) viewed these capabilities as either “inside” or “outside” oriented. Outside capabilities pertain to the organization’s relationships with its customers and the marketplace; whereas, “inside” capabilities pertain to the internal operational aspects of the organization. Using a similar logic, Treacy and Wiersema (1993) offered three types of ordinary capabilities: customer intimacy, innovation, and operational excellence. Customer intimacy stems from the interconnectedness between the organization and its customers. Innovation capability deals with the integration of “inside” and “outside” capabilities (Day,
Operational excellence refers to the emphasis and focus on productivity inside the firm to streamline processes. Kaplan and Norton (2006) identified what they termed as customer and process capabilities. In their view, process capabilities relate to the efficient use of resources to transform inputs into outputs. Given these and other similar accounts of ordinary capabilities, three distinct ordinary capabilities emerge (Daspit, 2012) for use in this dissertation: customer, innovation, and operational. In the next section, details of each ordinary capability are discussed.

Customer Capabilities

Customer capabilities allow the organization to create value for customers. This requires the organization to interact with its customers and the marketplace to determine what customers want and to permit those customers to offer feedback on the general perception of the organization as it relates to its products and services. Customer capabilities also offer the organization a direct connection to the customers and markets it serves. The relationships formed between the organization and its customer base provides the organization a means to anticipate changes (Day, 1994). Jaworski and Kohli (1993) refer to this as market orientation, which they found to influence business performance. Utilizing a market orientation approach, organizations are able to build long-term relationships with customers by delivering value to those customers. The consistent delivery of value to customers allows the organization to build a well-respected and valuable reputation in the market place (Hall, 1993). In doing so, organizations are responsive to customer needs and may anticipate market changes before they occur.
Innovation Capabilities

Innovation capabilities refer to the organization’s ability to use its technical skills and knowledge combined with other capabilities to create new products and services (Hoopes & Madsen, 2008). Innovations may be small and incremental or large and radical. Zahra, Van de Velde, and Larraneta (2007) discuss how knowledge conversion capabilities are different for different types of innovations. However, they specifically note that the organization’s ability to create new products and services rests in its ability to successfully convert knowledge. Treacy and Wiersema (1993) discussed how an organization’s ability to offer market-leading products and services is contingent on its ability to innovate. Innovation capabilities allow the firm to leverage existing capabilities and knowledge to create new processes and products that deliver value. Whether incremental or radical, these capabilities offer the organization an opportunity to “keep pace” with its customers and environment. Without these capabilities, an organization could not adapt and over time, would cease to remain relevant because it does possess the ability to change.

Operational Capabilities

Protogerou et al. (2011) defined operational capabilities as those that help the organization perform basic functions. Wu, Melnyk, and Flynn (2010) describe operational capabilities as firm specific capabilities that consist of processes, routines, and skills, which allow the organization to solve problems. These are the internal capabilities that are ultimately influenced by competition and the surrounding environment (Day, 1994). In other words, operational capabilities are internal to the organization and focus on the day-to-day use of
resources to convert inputs into outputs. This requires focus and coordination of different functions inside of the organization. Wu et al. (2010) contend that operational capabilities provide “unity, integration, and direction to resources and operational practices” (725-726). Given this, if an organization does not possess operational capabilities, they will likely struggle in delivering products and services to customers. While operational capabilities are typically associated with an internal focus, without them, organizations will likely struggle to meet the needs of their customers. Therefore, it is argued that operational capabilities are ordinary capabilities that contribute to the day-to-day function of conducting business.

In summary, ordinary capabilities enable the organization to create value for its customers. A synthesis of the literature resulted in three distinct ordinary capabilities: customer, innovation, and operational. Prior research linked ordinary capabilities to performance (see Protogerou et al, 2011; Wu et al, 2010; Day, 1994). As noted in Chapter 1, prior research directly linked DCs to performance (see Pavlou & El Sawy, 2011; Lichtenhalter & Muethel, 2012). However, the later studies do little to describe how DCs influence the relationships among ordinary capabilities. Figure 5 depicts a theoretical model that illustrates the existing relationships discussed in the literature. It includes the organizational processes of DCs and illustrates the relationships between DCs and ordinary capabilities and ordinary capabilities and performance. However, before moving into the refinement of the theoretical model, the next section will offer one way to view the concept of alignment. The next section describes alignment in the context of capabilities and proposes a theoretical model, which discusses, and hypothesizes how DCs influence the alignment between the different ordinary capabilities. Throughout the remainder of this dissertation, I will discuss the alignment of
ordinary capabilities and the role dynamic capabilities play. In the context of this dissertation, I borrow from Miner, Crane, and Vandenburg (1994) and Kathuria, Joshi, and Porth (2007) to conceptualize alignment.

The Process of Alignment

Past researchers have employed various terms to describe alignment. Hofer and Schendel (1979) referred to alignment by way of a “linking pin.” The pin represented the degree of coordination among corporate, business, and functional levels. Venkatraman (1989) used the term “fit” to conceptualize different types of alignment. While Venkatraman focused on issues pertaining to theoretical concepts and the testing schemes associated with the different types of fit, five of the six fits discussed describe how differing concepts either match, interact, or seek consistency and congruency between various components of an organization’s business model. Powell (1992) described how successful organizations are configured in a small number of ways, which result in alignment. Utilizing a resource-based approach, Powell (1992) argues that the limited number of configurations of resources is coordinated with one another to create unique capabilities. These assertions are consistent with those expressed by Hofer and Schendel (1979) in that they describe how different combinations of organizational components are likely to lead to varying degrees of coordination. The more components added, the greater the complexity. Added complexity makes the required coordination efforts more difficult to execute. Miner et al. (1994) discussed alignment in the context of congruence. They discuss how congruency is necessary for three components (organizational type, role prescriptions, and motive patterns) to work effectively together to benefit the organization.
Earlier research focused on alignment in the context of the firm matching with the environment. However, Miller (1992) illustrated how firms that achieved environmental alignment, often lacked internal alignment of capabilities needed to complement one another in order for the business to compete. This work emphasized the need to devise combinations (configurations) of process and structure changes with the coupling of complementary departments across the organization to more adequately address alignment.

In summary, early work on alignment focused on the organization’s alignment with its environment. Miller (1992) highlighted the need to consider both internal and external forms of alignment, if the desired outcome of alignment research is to understand organizational performance. This laid the foundation for work that emphasized the need to understand the integration/coordination of internal processes and how they are configured with one another to achieve a competitive advantage.

Types of Alignment – With a Focus on One of Them, Horizontal Alignment

As discussed in the previous section in this dissertation, earlier discussions dealing with alignment focused on the organization’s fit with the environment. However, Kathuria et al. (2007) describe alignment as being comprised of two types – vertical and horizontal. Vertical alignment enables planning and decision-making across various levels in the organization. Horizontal alignment, on the other hand, refers to coordination efforts across the organization that primarily deals with the integration capabilities used by the organization to create value.

Miner et al. (1994) investigated one type of horizontal alignment, i.e. the congruence between two capabilities of the organization. They defined it to be the degree to which the
strategy and structure of one capability is consistent with the strategy and structure of another capability. Lawrence and Lorsch (1967: 245) alluded earlier that these types of alignment demand that organization managers exhibit “a high order of integrative capacity,” which suggests that they must strategically configure resources and capabilities to achieve alignment. In other words, the more coordinated and integrated the two capabilities were, the greater the alignment for the organization. It was argued that highly coordinated and integrated capabilities result in stronger performance than capabilities, which lack coordination and integration. Given its focus on how well capabilities work with one another, when alignment is discussed in this study the focus is on what Kathuria et al. (2007) call “horizontal integration.”

One of the purposes of the dissertation is to better understand how dynamic capabilities influence the alignment of ordinary capabilities. In order to accomplish this challenge, a closer examination of alignment is needed. More specifically, the underlying dimensions of the alignment construct require investigation. Drawing from the works of Miner et al. (1994) and Kathuria et al. (2007), the next section identifies the relevant components of alignment for this study. Building on the developments of Protogerou et al. (2011) in which the significance of coordination and integration in the “strategic programming” of validating a business model were addressed, I will further describe how coordination and integration are necessary to allow the organization to adapt capabilities to meet strategic business plan objectives.

The Significance of Capability Alignment

Amit and Schoemaker (1993) describe the organization’s ability to evaluate existing
resources and combine or configure them in ways to create new capabilities, as a potential source of competitive advantage. This enables the organization to extract value from current capabilities and find ways to integrate the inherent utility with new or other capabilities found elsewhere in the organization. In other words, the organization has the ability to implement value-enhancing activities across the organization’s “basket of capabilities” (Winter, 2002). These configuration and coordination/integration efforts permit resource and capability orchestration (Helfat and Peteraf, 2003), which makes it difficult to for competitors to duplicate similar capability combinations (Teece, 2012). As a result, value creation for the organization occurs and may result in a temporary source of competitive advantage.

Configuration and coordination are relevant in the current study for three primary reasons. First, coordination/integration highlights the implementation efforts required to realize the potential benefits from the newly configured capability set or business model (Protogerou et al., 2011). Teece (2007) alludes to proper specification of a business model to ensure alignment. A properly specified business model is comprised of configured and coordinated capabilities that work together by creating synergy between capability areas. The ability of the organization to coordinate and integrate capabilities is paramount in the use of dynamic capabilities because coordination and integration enable action. It is one thing to devise configurations, yet, in order to realize the benefit of those configurations, the coordination and integration between capability areas is needed to operationalize communications and knowledge sharing between capabilities. This is consistent with Mintzberg’s (1979, 1983) assertion that coordinating mechanisms act as processes used to orchestrate activities throughout an organization.
Second, Protogerou et al. (2011) describe how seemingly small innovations have profound impacts on incumbent firms. They offered that the degree of coordination and integration influenced the impact of small innovations on technology in a given industry. Teece et al. (1997) arrived at a similar conclusion by suggesting that small technological changes could significantly influence the competitive landscape if an organization can effectively coordinate and integrate capabilities. O’Regan and Ghobadian (2004) go further to state that capabilities are a part of a bigger picture where the organization must align its capabilities with strategic goals and the business environment to achieve a competitive advantage. The configuration and integration of capabilities with the organization’s strategy provides alignment necessary to make adjustments to excel in the business environment.

Third, Powell (1992: 126) described how organizations create competitive advantages from the “design” variables of differentiation and integration, which are controlled by managers. When viewed in the context of this study, differentiation represents the limited combinations/configurations that organizations create by carefully coordinating resources to align capabilities in new ways. The resulting product is the alignment of capabilities that lead to value creation for the organization. Smith and Reece (1999) described the importance of “matching” operational capabilities to the business strategy. In their study, “external fit” is used to operationalize the coordination and integration efforts of a branch to match the overall business strategy. They found that external fit positively influences performance, which is consistent with the present discussion regarding the relevance of configuration and coordination. Given these assertions, the present study examines the roles of configuration
and coordination/integration, in the context of ordinary capability alignment as a means to achieve strategic business objectives.

Two Components of Capability Alignment – Configuration and Coordination

*Configuration*

Different configurations represent various combinations or paths that the organization can take to fulfill its purpose and achieve its objectives. For the purposes of this dissertation, configuration is more narrowly defined. Configuration represents the orchestration of resources between ordinary capabilities, which yields an optimal utility, greater than the sum of utilities from each ordinary capability. Configuration describes how different combinations of ordinary capabilities provide strategic direction for the organization. For this to occur, departments within and across ordinary capabilities must work together and share a common purpose. The common purpose represents the culmination of work efforts, which when combined and jointly rationalized, represent a unique configuration that creates value for the organization. In other words, the configuration of any two ordinary capabilities may result in a valuable and rare output, which can contribute to the organization’s competitive advantage.

For instance, Honda configures its innovation and operational capabilities to deliver engines across different market and product segments. This alignment of innovation and operational capabilities allows Honda to make best in class engines for cars, lawn equipment, and other portable engine-driven equipment. Because of this, the configuration of capabilities has strategic implications for the organization.
Nath and Sudharshan (1994) called for further investigation of configurations because of the likely impact on performance. Configurations are planned integrations that possess strategic importance for the organization because of their ability to shape the competitive footprint that the organization targets. For instance, if an organization possesses an operational capability that permits it to quickly change over production lines but this capability is not configured and coordinated with the customer capabilities, the utility stemming from the operational capability will likely be suboptimal. If the ability to quickly change production lines has limited market value, it may not ultimately create value for the organization. However, when this operational capability is configured and coordinated with customer capabilities, the organization may be able to attract more customers due to lower lead times and greater product availability (Jaworksi and Kholi, 1993). Hence, there is a need to strategically link or configure these ordinary capabilities in order to provide the best possibility of alignment.

Establishing an optimal configuration is the first step towards alignment. This allows the organization to set a direction towards a specific purpose, and establishes the outline needed for execution. The integration and coordination across the different capabilities are less ambiguous if the best possible configuration identified in the beginning and refined over time (Helfat and Raubitschek, 2000). The configuration serves as the foundation for the alignment base. When executed well, a purposeful configuration lends itself to the skillful orchestration or coordination of specific exchanges between and within each ordinary capability. Pavlou and El Sawy (2011) found that operational capabilities positively influence new product development (NPD) performance (which is comprised of product effectiveness, process efficiency, and cross-functional integration). Given this, it seems reasonable to assume that if
an organization achieves a near optimal configuration between innovation and operations, it is likely that the resulting areas, which comprise these capabilities, will be more in concert regarding new product development and continuous product improvements. This will position the organization to coordinate tasks and activities between them to the best of its ability.

In summary, configuration is the strategic genus that integrates ordinary capabilities in new ways to create value. Configuration requires the integration of capabilities across the organization to achieve desired strategic objectives. By integrating new capabilities in different ways, the organization creates a valuable and rare capability permitting it to achieve a sustainable competitive advantage that is difficult for competitors to duplicate. In addition, these configurations reconfigure ordinary capabilities in a manner that align subsequent departments thru shared goals and objectives. This refocus of direction provides the basis for the organization to achieve optimal alignments, which could lead to improved performance.

Coordination

Coordination refers to the specific interactions and transactions that occur at both the cross-functional and the intra-functional levels (Kathuria et al., 2007). Configuration accounts for a broader perspective of alignment, while coordination deals with the details and nuances at a finer-grained level. Coordination primarily looks internally for alignment of the specific elements that comprise the capability. Configuration, on the other hand, looks both internally and externally (of the ordinary capability) to determine the best course of action for the organization given the environment and its resource stocks.
In order to execute tactical plans to achieve strategic objectives, the newly derived configurations require a coordination of tasks and synchronization of activities (Helfat and Peteraf, 2003). Coordination requires effective resource allocation (Eisenhardt and Brown, 1999) and the identification of complementarities and synergies (Eisenhardt and Galunic, 2000). In the context of alignment, coordination refers to the executional aspects of configuration. To ensure effective coordination, the tactical details of ordinary capability interaction and execution are of paramount concern. First, mechanisms must be in place to enable the sound execution of tasks within the ordinary capability. Here, standardization plays an important role because it provides stability within each ordinary capability. Second, in order for the ordinary capability to integrate with other ordinary capabilities, processes should be in place to facilitate the flow of information amongst capabilities. Finally, there is a need for the managers of ordinary capabilities to stay current with management systems that will permit future changes (Protogerou et al., 2011). As the environment changes, the systems used to enable ordinary capability integration requires updates.

Rhee and Mehra (2006) investigated how the coordination/integration of marketing and operations influenced performance in a service firm. They found that the skillful coordination between these sometimes contradicting departments/areas could positively influence performance. Given this, organizations must look past the possible contradictions presented when attempting to coordinate between different capability areas and focus on the complementary aspects of the departments to achieve coordination.

Helfat and Raubitschek (2000) argued the importance of integrating and coordinating knowledge, both tacit and codified, in the vertical chain to develop complex products. In other
words, being able to pass knowledge from one capability area to the next is foundational to the success of innovative firms. For example, if customer desires regarding a product enhancement are not passed along the vertical chain to engineering or research and development (R&D), it is highly unlikely that those customer demands will be met. The authors go on to describe how integration/coordination is necessary in the sequencing of product releases, to ensure smooth phase-in and phase-out of products. These handoffs require integration across capability areas within the vertical chain to allow for smooth transitions.

In summary, coordination pertains to the organization’s ability to operationalize strategic objectives that require the integration between differing ordinary capabilities. As a result, coordination represents the specific tactics and activities required to execute the goals outlined for these objectives. Hence, coordination is tactical in nature and illustrates the details of how information is shared among capabilities. Sharing of information between the teams and departments within different ordinary capabilities is necessary to efficiently and effectively execute integrated activities. This implementation of the configuration permits the organization to realize the benefits from the uniquely created combinations stemming from integrating and coordinating across capabilities. The resulting outputs from these aligned capabilities translate into value for the organization.

Together the components of alignment, configuration and coordination, work in concert to extract value from new and existing capability combinations. The organization is able to devise and implement a strategic plan to achieve desired objectives. Table 3 summarizes the elements of capability alignment by offering a synthesis of configuration and coordination.
Given this insight on the components of alignment, in what follows next, I will discuss the specific alignment relationships between capabilities of interest in this dissertation.

Table 3

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Strategic in nature</td>
<td>- Regular communication</td>
</tr>
<tr>
<td>- Integration</td>
<td>- Shared information</td>
</tr>
<tr>
<td>- Shared goals</td>
<td>- Integrated and interactive systems</td>
</tr>
<tr>
<td>- Closely working together</td>
<td>- Incorporate technical knowledge</td>
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Operationalizing Alignment Components of Ordinary Capability Relationships

Customer-Innovation Capability Alignment

As organizations seek ways to achieve congruency or fit at the ordinary capability level, a higher level of integration stems from strategies, which are configured and coordinated across the respective ordinary capabilities (Kathuria et al., 2007). In the case of customer and innovation capabilities, the organization may be more proficient at meeting customer demands for new products and solutions if customer and innovation capabilities are highly configured and coordinated. Customer demands often require organizations to adapt through innovation. Pascale (1999) argues that through the pursuit of adaptive systems organizations achieve desired change, while avoiding the pitfall of “equilibrium” between capabilities, which is counterproductive.
Customer-Innovation Alignment: Configuration

First, in order to establish a strong foundation to achieve alignment, the strategic nature of the fit between customer and innovation related capabilities must focus on objectives that will retain existing customers and attract new ones. To this end, the focus of the alignment will be on meeting customer needs through new and improved products and services (Dougherty, 1992). Second, the integration requires the two ordinary capabilities to take advantage of different skill levels to influence product and service design. For example, to maximize the output from the integration, departments that enable the customer and innovation capabilities must balance the knowledge of customer-desired functionality of a product with the valence of feasible designs capable of being delivered consistently. If this level of integration does not occur, newly developed products will not meet customer expectations. Jayachandran et al., (2004) found that customer knowledge has a positive relationship with the organization’s ability to respond to customer demands. Given this, integration helps facilitate information transfer that is informed and purposeful. Third, through shared goals, the resulting output from the uniquely combined capability sets results in value creation for the organization. Shared goals establish a common objective for the combined capability areas to jointly focus their differing skills. Finally, by closely working together, customer facing and innovation related departments jointly create new product and market strategies that are difficult to duplicate. By working closely together, an organization can take advantage of different knowledge that exists about customers and internal technical abilities to better identify what the customer desires and design a product or service that meets their needs. While working closely together may
result in new products, specifying shared goals ensures the efficient collaboration among the teams/departments from the respective capability areas.

**Customer-Innovation Alignment: Coordination**

To coordinate the interactions between ordinary capabilities that enable strategy execution, formal and informal mechanisms are needed. These mechanisms will ensure communication, encourage information sharing, integrate systems, and distribute technical knowledge across the capabilities. To achieve the desired effectiveness projected in the newly proposed configuration, a first step is to create an interface between the capability areas that forge *regular communication*. Frequent communications are necessary to ensure that customer demands and desires regarding products are captured and effectively communicated. Second, customer-related and innovation-related areas must find ways to *share information*. The unique combination of outside information from customers, suppliers, and competitors can better inform both capability areas and drive adaptations of internal tacit and codified information to benefit the organization (Dosi, Nelson, and Winter, 2002). Third, once captured, communicated, and shared, the conversion of information into resulting knowledge must be entered into an *integrated interactive system* that permits various departments from each of the capability areas access. This tool will foster rapid information sharing and help codify the knowledge in a manner that permits repetition and sustainability. Finally, in dealing with the development of new products and services, customer-facing departments and innovation-related departments must incorporate *technical knowledge* into the new product development process. Whether it is information about competitor products or performance information
about the organization’s own products, this knowledge may result in improvements and/or design changes that could better meet customer needs.

In a near-optimal configuration, these mechanisms are employed to maximize the joint contributions from customer and innovation capabilities. By integrating key strategy elements from each capability into an interrelated, coordinated set of activities and tasks, the organization improves alignment of these capabilities to meet customer needs. For example, if the marketing team (customer capability related) is charged with creating a new product/service offering for a new customer segment, the marketing team will likely need to have several meetings with engineering or R&D (innovation capability related) to develop the offering. To enhance the integration of these two capabilities, members from each department may be relocated to sit together to enhance communications and foster cohesiveness between the teams. This closeness improves the interface between customer and innovation capabilities (Li and Calantone, 1998).

In summary, alignment between customer and innovation capabilities is achieved through the joint focus on product development and enhancements. The configuration of these capabilities emphasizes the need to meet frequently to resolve customer issues and to mutually develop products. However, while the interactions are frequent, they may span several months or years, due to the long-termed focus of product development. Shared goals between the capabilities begin to integrate them in a manner that forges communication and facilitates the information exchanges needed to achieve overall strategic objectives.
Customer-Operational Capability Alignment

In the identification of customer solutions, the organization must determine if the existing operational model aligns with customer demands and expectations (Teece, 2007). The organization tries to avoid possible execution traps (O’Reilly & Tushman, 2008) or equilibrium (Pascale, 1999) by deciphering the gaps in alignment between what the customer wants, and what capabilities the organization already possesses.

Customer-Operational Capability Alignment: Configuration

At the broadest sense, the configuration of customer-operational capabilities deals with the combination of capabilities to ensure day-to-day delivery of customer products and solutions. This critical alignment between customer demands and the organization’s ability to execute is consistent with Zollo and Winter (2002) who stated that operational capabilities are necessary for an organization to compete. Without the ability to change day-to-day basic functions to meet customer needs, the organization will likely fail to meet customer expectations. Therefore, it becomes imperative for the organization to align its customer and operational capabilities. This alignment permits the organization to make changes, which affect the day-to-day internal functions that allow changes in customer and operational capabilities that meet customer needs (Helfat et al., 2007).

The configurational components of the customer-operational capability alignment strategically focus on new product/service delivery. To this end, the customer-facing and operational capability areas meet on a regular basis not to discuss new products per se, but to discuss the delivery and quality of products distributed to customers. These capability areas
will likely have shared goals of on-time delivery and product quality. These shared goals integrate the two capabilities and focus each on fine tuning internal processes to meet and/or exceed customer expectations. In doing so, the resulting outcome lowers waste for the organization, which enhances value creation. Given the alignment of capabilities focused on delivery and quality, customer-facing and operational related capabilities work together to deliver new products and services to the market. Unlike customer-innovation alignment, the emphasis here is not on the development of the actual product or service, but instead on the delivery of the newly created product/service.

**Customer-Operational Capability Alignment: Coordination**

From a coordination standpoint, the tactical integration required for an effective configuration deals with the need to standardize processes. There is also a desire to efficiently convert information regarding customer demands into products and services the organization can sell. For example, if the marketing department (customer capability related) has the capability to detect shifts in customer buying patterns, the marketing department could share this information with the operations department (operational capability related) to adjust the production forecast in anticipation of the shift. This creates value for the organization by shifting resources away from less popular products in favor of those that will likely turn faster. The marketing department could have simply raised its forecast for those products without notifying the operations department about the trend. However, doing so would have resulted in higher inventory.
In order to meet the demands outlined by the proposed realignment of customer and operational capabilities, the capability areas must establish regular communication, share information, and utilize shared processes and systems to evaluate new and existing products. First, the two capability areas must meet regularly. Meeting on a frequent basis encourages information sharing, which is necessary to address customer wants. Second, if there is a problem with the product’s performance not communicated to operations, the issues will persist and customer needs go unfulfilled. To avoid repeating past customer issues, the need for interactive and integrated systems between customer-facing and operational capability areas is apparent. These systems work to capture tacit knowledge held by sales people and process owners that may not show up in a customer specification. This system will allow the organization to capture and codify the information to avoid repeated failures. Finally, given the potential impact on customers, customer-facing and operational capability areas must jointly engage in testing of new processes and software. By engaging in these activities, the organization can debug issues prior to shipping defective products to customers. Joint testing will also ensure that the internal handoffs between customer-facing and operational departments are streamlined and effective.

Rhee and Mehra (2006) found that the strategic fit between marketing (customer capability) and operations (operational capability) positively influences firm performance in the banking industry. In this case, they found that it takes both strategic and tactical fit to enhance organizational performance. This supports the notion that the customer-operational capabilities relationship is an important alignment when assessing the success of an
organization. In other words, it is necessary to configure and coordinate across marketing and operations to enhance value for the organization.

In summary, the customer-operational alignment focuses on the delivery of products and services to the market. From a configurational perspective, the areas of concern deal with day-to-day interactions that require departments from customer and operational capability areas to work closely together to resolve current product issues and deliver newly developed products to the marketplace. Through the lens of coordination, the configuration permits the organization to engage in frequent communications that facilitate the sharing of information so that timely adjustments occur to satisfy customer demands. These interactions more closely reflect real-time because issues can have a direct and immediate impact on customers.

Innovation-Operational Capabilities Alignment

The organization must find ways to encourage change and innovation, while orchestrating and coordinating specialized assets (Helfat et al., 2007). In other words, the organization must strike a balance between using its innovation and operational capabilities. Too much innovation will render existing operational capabilities useless. At the same time, clinging to existing operational routines may stifle innovation. Pavlou and El Sawy (2011) described an operational, new product development (NPD) capability, which offers a balance between operational and innovation capabilities by linking the two capabilities via NPD. This hybrid activity blends the two ordinary capabilities in a manner that results in a unique resource configuration, which creates value for the organization.
Innovation-Operational Capability Alignment: Configuration

From a configuration standpoint, the innovation-operational capability alignment embodies the need for strategic interaction due to the desire to develop and design innovation products and services that ensure consistent delivery to customers. To accomplish this objective, frequent meetings between customer-facing and operational teams are necessary. This fosters a close working relationship between the areas, which will identify dependencies and reinforce the significance of their joint efforts. Departments associated with innovation capabilities (e.g. research and development, engineering, etc.) are often on the leading edge of change for an organization. These groups typically have goals to create new products or revitalize existing ones. However, to realize these goals, innovation-related areas must work with operations-related areas so that the newly created designs yield consistent builds and deliveries by operations. Shared or common goals are the results of these mutually created strategic plans. In translating the plans into viable products/solutions, the innovation and operational capability areas also engage in joint testing and evaluation of the newly created products prior to product launch. Collaborative testing encourages communication that is necessary to improve the design to ensure the new product is reliable and ready for launch. Failing to deliver a product design that can be produced only yields good ideas from the innovation capabilities. If these capabilities lack alignment, the production or new or improved products become more difficult.

Innovation-Operation Capability Alignment: Coordination

Through the lens of coordination, the “orchestration” of resources is of primary interest
when aligning these capabilities. To ensure success, organizations often engage in benchmarking to assess competitors’ products and to evaluate customer expectations. Departments associated with innovation and operational capabilities participate in these activities to identify gaps in product performance and customer demands. By taking part in these activities together, manufacturers deliver improved designs faster, without unplanned delays. For instance, several automobile manufacturers can redesign or restyle the exterior and interior of a vehicle, without affecting the major welding and assembly points from the previous model. The frequent communication and regular interactions between R&D and production engineering permit the design changes without altering the assembly line. Hence, automobile manufacturers complete and deliver new automobile designs in half the time (two years or less now) because new equipment is not necessary for the redesigned vehicle. Massive capital outlays are unnecessary for new equipment and long plant shutdowns for new equipment installation are no longer required.

While benchmarking is beneficial, regular communication during benchmarking and other activities ensures the flow of pertinent information. These information flows are possible through the integrated and interactive systems used by departments in innovation and operations to facilitate work objectives. To this end, the frequent communications and the use of an integrated system allows the organization to codify the information and leverage the information to formulate standardized processes. Standardization allows the organization to consistently repeat the output from its innovation and operational capabilities. This is highly desirable, given the objective to reliably meet or exceed customer expectations.
In summary, innovation-operational alignment emphasizes goal setting that targets the use of innovation and operation capabilities to deliver new products and solutions that allow the organization to address changes in customer preferences. Ordinary capability alignment permits the organization to focus on aligning internal capabilities to achieve a desired fit. Achieving an internal fit of ordinary capabilities positions the organization to address the changes posed by the environment. The outcome of ordinary capability alignment is not of specific interest in this study. However, by focusing on the components of ordinary capability alignment, this study offers insight into how future research may be able to address the influences of ordinary capability alignment on organization performance in a dynamic environment.

The Relationships between DCs and Ordinary Capability Alignment

Now that I have operationalized both the managerial processes of the DC construct and the ordinary capability alignment constructs, I will describe existing relationships between these DCs and ordinary capabilities found in the literature. The intent of this section is twofold. First, an overview of the extant literature identifies the direct relationships between DCs and ordinary capabilities. These theoretical linkages serve as a foundation to expand the theoretical argument from a direct relationship between DCs and ordinary capabilities, to a proposed model that seeks to illustrate how the newly conceptualized DCs construct influences ordinary capability alignment. Second, a review of the literature will express the emphasis prior works placed on the direct relationships between the constructs. While beneficial to establish correlational relationships between the constructs, prior works are limited in demonstrating
how the relationships function. Given this, the present study offers insight into how the relationships function through the configuration and/or coordination between ordinary capabilities. Figure 5 provides a summary representation of the direct relationships between DCs and ordinary capabilities currently found in the literature.

Figure 5

Capability Relationships Currently in the Literature

The solid arrows represent prior tested theoretical relationships. The dotted arrows represent relationships that are theoretically discussed, but untested thus far. The relationships between DCs, ordinary capabilities, and organizational performance illustrate how DCs influence ordinary capabilities. If we view each ordinary capability as a sub-system, we can visualize how changes to an ordinary capability may be viewed as regenerative, if an entirely new ordinary capability was developed. For example, when the cable TV industry switched from analog to digital cable, the operational capability system was completely changed. An entirely new system was required to run digital cable versus an analog system. This system
change represented a form of regenerative DCs. Industry-wide technological innovations in TVs, computers, smartphones, and other communication devices drove demand for faster download speeds and higher data capacity. Analog lines could not accommodate this demand, which compelled organizations within the cable industry to change their systems of operation.

Figure 6
Theoretical Model Extracted from the Literature and Developed Herein

Visualizing how the environment drove this demand externally, it is not clear how or if relationships (alignment) among the ordinary capability changed. In other words, the existing literature explaining how DCs influence the relationships between ordinary capabilities is scant. To extend and test existing theory in this area, this dissertation will focus on how internal DCs (incremental and renewing) influence the alignment between ordinary capabilities (e.g. operational, customer, and innovation). The next section describes each ordinary capability and proposes how the DCs influence the alignment among ordinary capabilities.
Hypothesizing Relationships between DCs and the Alignment of Ordinary Capabilities

In Chapter 1, I argued that the managerial processes of DCs moderate the ability of the organizational processes of DCs to affect change in ordinary capabilities. Since I have identified three primary areas of alignment between ordinary capability types, I will now develop arguments that lead to appropriate hypotheses regarding the relationship between DCs and the alignment of ordinary capabilities of an organization.

Organizational Processes of DCs and Customer - Innovation Capabilities Alignment

According to Jaworski and Kohli (1993), the organizational process of sensing directly relates to the skillful interpretation of market and customer intelligence. They argued that this organizational process of DCs exists if the organization has relationships with its customers that allow it to respond to customers’ needs. Liao et al. (2007) described the relationship between customer needs and an organization’s innovation capability by finding that the internal R&D capabilities positively influenced innovation. While there is evidence of a connection between customer and innovation capabilities, it is not clear how dynamic capability processes may influence this relationship.

Examining this from an organizational process perspective, the ability to sense customer needs and seize the R&D capabilities needed create customer solutions for those needs requires alignment between customer and innovation capabilities. Managerial processes of DCs allow the organization to apply a strategic focus that determines the degree to which the organizational processes are able to inform the fit between customer and innovation capabilities. For example, Deeds, DeCarolis, and Coombs (1999) found that the ability of the
organization to deliver new products stemmed from the managerial processes used to translate information. In their study, scientists applied their knowledge of strategy and an understanding of their systems to achieve a higher degree of alignment, which resulted in the delivery of new products. In this case, new products were the output of a high degree of alignment between customer and innovation capabilities. The organization’s application of sensing and seizing, led to the transformation of resources that resulted in new products. Given this, it is likely that an organization with strong organizational processes of DCs will positively influence customer-innovation capabilities alignment. Therefore, I hypothesize the following:

H2: The organizational processes of DCs have a positive effect on customer-innovation capabilities alignment.

However, without the application of knowledge derived from the managerial processes of DCs, it is unlikely that new products would have emerged. Hence, I argue that managerial processes moderate the relationship between organizational processes of DCs and customer-innovation alignment.

Liao, Kickul, and Mao (2009) described how entrepreneurial internet firms used organizational processes of DCs (scanning and seizing) to adjust their resource base to devise new ways to conduct business. The new ways to conduct business stemmed from the interaction the organizations had with customers regarding new ecommerce solutions. Using managerial processes of DCs, these organizations applied strategic rationale and took a systems integration approach to devise new business systems to meet customer needs. They applied a governance structure that cemented a sustainable e-commerce solution. While these organizations sensed and sought to seize opportunities, I argue that the application of the managerial processes of DCs determined the degree to which the ordinary capabilities of
customer and innovation aligned. Given this, I propose that the relationship between the organizational processes of DCs and customer-innovation capabilities is influenced by the managerial processes of DCs. Therefore, I propose the following hypotheses.

H3: The managerial processes of DCs moderate the relationship between organizational processes of DCs and the alignment between customer-innovation capabilities such that higher levels of managerial processes strengthen the positive effect of organizational processes of DCs on customer-innovations capability alignment.

Organizational Processes of DCs and Customer - Operational Capabilities Alignment

In the identification of customer solutions, the organization engages in the organizational process of seizing to determine if the existing business model aligns with what is needed to meet customer expectations (Teece, 2007). During the seizing process, the organization tries to avoid possible execution traps (O’Reilly & Tushman, 2008) by deciphering the gaps in alignment between what the customer wants, and what capabilities the organization already possesses. In short, the organizational process of seizing offers insight into the desired customer capabilities, as well as insight into possible gaps in other capabilities that may require reconfiguration.

Teece et al. (1997) noted that the organizational processes of DCs do not result in marketable goods or services, but instead realign ordinary capabilities. Ordinary capabilities do have the propensity to yield marketable goods and/or services. Our collective understanding of operational capabilities suggests that these capabilities play a vital role in the day-to-day function of the organization. This is consistent with Zollo and Winter (2002) who stated that operational capabilities are necessary for an organization to compete. Without the ability to change day-to-day basic functions to meet customer needs, the organization will likely fail to
meet customer expectations. Therefore, it becomes imperative for the organization to align its
customer and operational capabilities. This alignment permits the organization to make
changes that affect the day-to-day internal functions that allow changes in customer
capabilities that meet customer needs. To further illustrate, I hypothesize the following direct
relationship.

**H4:** The organizational processes of DCs positively influence customer-operational
capability alignment.

Sirmon, Hitt, and Ireland (2007) described how process and sub-process synchronization
creates value. In the case of organizational processes of DCs, these processes drive the
scanning and identification of solutions that permit the possible reconfiguration of ordinary
capabilities. The processes involved with ordinary capabilities deal with the actual creation of
value. While, each set of processes offers different benefits for the organization, the
managerial processes determine the configuration that influences deployment (Easterby-Smith
et al., 2009). In other words, managerial processes moderates the degree in which the
organizational processes of DCs influence the customer-operational capabilities relationship by
determining the best use of organizational assets. Simon et al. (2011) describe this process as
asset orchestration. Given this, I hypothesize the following relationship.

**H5:** The managerial processes of DCs moderates the relationship between
organizational processes of DCs and the alignment between customer-operational
capabilities such that higher levels of managerial processes strengthens the positive
effect of organizational processes of DCs on customer-operational capabilities
alignment.
Organizational Processes of DCs and Operational – Innovation Capabilities Alignment

Protogerou et al. (2011) argued that the combination of managerial and organizational processes of DCs govern the rate of change in operational capabilities. These capabilities consist of the processes and routines needed to effectively and efficiently run the organization. Since these capabilities are used to run the day-to-day business of the organization, they must possess a degree of flexibility to meet changing demands. While these capabilities have a built in degree of flexibility, typically associated with volume scaling, they also require constant innovation to adapt when necessary.

When considering the organizational processes of DCs, reconfiguration involves transforming existing capabilities and developing new ones to realize the benefits from sensing and seizing opportunities. The organization must find ways to encourage change and innovation, while orchestrating and coordinating specialized assets (Helfat et al., 2007). In other words, the organization must strike a balance between using its innovation and operational capabilities. Too much innovation will render existing operational capabilities useless. At the same time, clinging to existing operational routines may stifle innovation. Pavlou and El Sawy (2011) described an operational, new product development (NPD) capability, which offers a balance between operational and innovation capabilities by linking the two capabilities via NPD. This hybrid activity blends the two ordinary capabilities in a manner that still results in resource reconfiguration.

In examining the relationship between organizational processes and operational-innovation alignment, it is evident that the reconfiguring process of DCs is inclusive of operational and innovation capabilities. While Pavlou and El Sawy (2011) explicitly described a
hybrid construct in operational new product development (NPD), I assert that the relationship extends beyond the development of new products. When discussing innovation and operational capabilities, it is necessary to examine reconfiguration from two perspectives: process and product. An organization’s need to reconfigure may require transformation of processes and/or products. Therefore, it is argued here that the organizational processes of DCs will influence the alignment between operational and innovation capabilities. As a result, it is expected that the organizational processes of DCs will positively influence operational-innovation capability alignment.

H6: The organizational processes of DCs positively influence operational-innovation capability alignment.

However, as depicted in the other relationships between organizational processes of DCs and ordinary capability alignments, managerial processes shapes the magnitude of this relationship. For example, in the orchestration and coordination of assets (i.e. capabilities), managerial processes provides the strategic insight needed to align capabilities in a manner that drives value for the organization. The alignment is achieved through focused goal-setting that targets the use of the capabilities (dynamic and ordinary) in a manner that is consistent with a purpose that supports overall strategic objectives. In this case, poorly prescribed managerial processes will result in a misguided action plan for the use of innovation and operational capabilities when the organization attempts to realize the benefits from its organizational processes. Given this, it is expected that the managerial processes of DCs will influence the organizational process of DCs and operational-innovation capability alignment.

H7: The managerial processes of DCs moderates the relationship between organizational processes of DCs and the alignment between operational-innovation capabilities such that higher levels of managerial processes strengthens the positive
effect of organizational processes of DCs on operational-innovation capabilities alignment.

Figure 7 represents the fully integrated research model for this investigation. The model will be used to address Research Question-3 posed in Chapter 1 and contains the two aspects of DCs and illustrates how they work together to influence ordinary capability alignment.

Figure 7

Fully Integrated Research Model

Chapter Summary

This chapter began with an overview of relevant theoretical perspectives used to examine the managerial processes of DCs. The development was anchored in the fundamental tenet of configuration theory that organizations seek alignment or “proper fit” (Randolph and Dess, 1982; Venkataraman, 1989; Miller, 1992) to achieve competitive advantage in the marketplace. Using a capability lens to illustrate how organizations change, alignment occurs
between ordinary capabilities of the organization, which represents the “alignment” challenge of the organization.

I borrow from the literature the notion that organizations configure DCs to influence ordinary capabilities (Collis, 1994; Teece, 2007; Eisenhardt and Martin, 2000; Ambrosini et al., 2009; Helfat and Winter, 2011; Drnevich and Kriauciunas, 2011) to extend a theoretical argument that seeks to explain how DCs affect organizational change through the alignment of ordinary capabilities. In order to explore the “alignment” challenge, I explore two constructs of interest – a refined conceptualization of DCs and ordinary capability alignment.

I begin with the DC construct. My review of the literature suggests that there is much work conducted on organizational processes of DCs. However, I highlight the absence of research on the managerial processes of DCs. Consequently, this development begins by operationalizing the managerial processes. These efforts result in the identification of three processes comprising the managerial processes associated with the creation and deployment of DCs, i.e., (1) processes associated with creating and implementing the strategic rationale, (2) processes associated with systems integration and (3) processes associated with the governance structure.

Further development results in the identification of the underlying dimensions of each of the processes of the managerial processes. When combined with existing operationalizations of organizational processes of DCs, the operationalization of managerial processes results in a comprehensive reconceptualization of the DC construct that displays both organizational and managerial elements. Finally, adopting the typology of DCs offered by
Ambrosini et al. (2009), I delineate a specific focus of this dissertation by recognizing that the investigation will address “internal” DCs used to enable alignment of ordinary capabilities.

Next, I address the second construct of interest. I conducted a literature review of the “ordinary capability” construct. After a review of the literature, three specific ordinary capabilities emerged and were included in this study – customer capability, innovative capability, and operational capability. Then, discussions of alignment of these ordinary capabilities ensue. Each alignment relationship (i.e. – customer-innovation, customer-operational, and innovation-operational) describes how the configuration and coordination of the respective ordinary influence organizational change. These developments attempt to explain how proper “fit” of ordinary capabilities is necessary to positively impact change.

Following these developments, relationships between the newly specified DC construct (containing both organizational processes and managerial processes) and each type of ordinary capability alignment was examined. The manner in which DCs influenced the alignments of ordinary capabilities was discussed and hypothesized. The chapter closes with a presentation of the fully integrated research model. The following chapter describes and discusses the methodology used to examine the hypothesized relationships.
CHAPTER 3

METHOD

Overview

The purpose of this investigation is two-fold. First, the study attempts to reconceptualize the dynamic capability (DC) construct by building upon the works of Adner and Helfat (2003) and Kor and Mesko (2013) to operationalize the managerial processes of dynamic capabilities (DCs). Second, the study seeks to examine how the newly conceptualized DC construct influences the alignment between various types of ordinary capabilities. More specifically, this study will develop a scale for the managerial processes of DCs and assess the influence of both organizational and managerial processes on ordinary capability alignment. Chapter 1 offered an in depth evaluation of the research questions posed in Chapter 1. In Chapter 1, I proposed theoretical explanations to address the research questions and I hypothesized relationships that identified the architectural dimensions of DC. Additionally, the hypotheses depict how DCs have direct and moderating effects on the alignment between ordinary capabilities.

In this chapter, I first explain the constructs and measures used to evaluate the hypotheses. Based on the theoretical arguments presented in Chapter 1, I operationalize each construct and dimension. In the case of measures newly developed in this study (i.e. the architectural dimensions), I provide sub-dimensions, where needed to offer additional detail. Following the operationalization of the constructs and dimensions, I explain the research methodology used.
Constructs and Measures

This investigation examines the architectural dimensions of DCs. The architectural dimensions represent the managerial processes of DCs and are hypothesized to moderate the relationship between the organizational processes of DCs and ordinary capabilities. DCs are therefore comprised of two types of processes: operational (organizational) and managerial (architectural). Organizational processes of DCs consist of three elements: sensing, seizing, and reconfiguring. As described in Chapter 2, the managerial processes of DCs are measured on three dimensions: strategic rationale, systems integration, and governance structure. Chapter 2 also described three ordinary capabilities: customer capabilities, innovation capabilities, and operational capabilities. Organizations use ordinary capabilities to deliver products or services on a day-to-day basis. Given this, alignment between ordinary capabilities is necessary for the organization to function on a daily basis. Therefore, specific measures to assess the alignment between these ordinary capabilities are necessary.

This investigation will also use control variables to account for variance posed by external factors. I discuss control variables and their operationalization, along with the primary variables of interest, to provide a detailed description of how I employ them in this study. Whenever possible, I adapted the original items from previously developed scales to fit the context of this study. In cases where no scale currently exists, I used the theory presented in Chapter 2 to create scales consistent with prior theoretical arguments. All items are measured on a 7-point Likert scale. The range of the scale is from 1 (strongly disagree) to 7 (strongly agree), unless otherwise noted.
Organizational Processes of DCs

The organizational processes of DCs construct was measured using previously validated scales by Pavlou and El Sawy (2011) for sensing and by Lichtenthaler and Muethel (2012) for seizing and reconfiguring. Two different scales were used for the following reasons. First, Pavlou and El Sawy (2011) operationalized the sensing process of DC, which was consistent with prior theoretical arguments found in Teece (2007) and Chapter 1 of this dissertation. Second, Lichtenthaler and Muethel (2012) offered a succinct depiction of the seizing and reconfiguring (which they refer to as transforming) processes. While Pavlou and El Sawy (2011) contained additional items that could represent the DC-organizational processes construct, they identified four sub-dimensions: sensing, learning, integrating, and coordinating. The principal components analysis (PCA) they ran suggested that those items were orthogonal and represented different factors. Upon closer examination, these four dimensions could possibly represent the seizing and reconfiguration dimensions described in this study. Given the four orthogonal dimensions from their PCA, item loadings consistent with the theory presented for this study were employed. The scale developed by Pavlou and El Sawy (2011), as well as the scale developed by Lichtenthaler and Muethel (2012) were tested and found to be reliable, suggesting that the measures possessed internal and discriminate validity.

In total, 11 items were identified for use from the Pavlou and El Sawy (2011), and Lichtenthaler and Muethel (2012) operationalizations for the organizational processes of DCs. Each of the three organizational processes for sensing, seizing, and reconfiguring contained four, three, and four items respectively. A sample item from the sensing process scale is, “We frequently scan the environment to identify new business opportunities.”
Managerial Processes of DCs

One of the contributions from this investigation is the development of a scale to assess the managerial processes of DCs. In Chapter 2, organizational architecture was used to illustrate how managerial processes can be used to describe how DCs influence the alignment of ordinary capabilities. Chapter 1 identified gaps in the existing DC literature. More specifically, managerial processes represent a void in the literature; given this, there currently are no composite scales to evaluate these processes, only theoretical extensions that argue their existence.

Given this challenge, Chapter 2 contains theoretical arguments for three newly developed dimensions that represent basic functions of management (leading & planning, organizing, and controlling) to manage an organization’s capability base (Williams, 2013). To contextualize these basic functions from a capabilities perspective, I offer insight into the managerial processes of DCs by specifying three dimensions. Those dimensions are strategic rationale, systems integration, and governance structure. Next, I operationalize the newly created dimensions.

Strategic Rationale

The theoretical arguments developed in Chapter 2 suggest 3 sub-dimensions of strategic rationale: guiding principles, value-creating logic, and goal-directed activities. Guiding principles contained two items that were consistent with the theoretical arguments put forth by Avermaete (2005). One item was borrowed from Arend (2012) due to its focus on achieving output via explicitly held principles. The second item was an extension of theory used to
articulate a strategic vision that serves as a compass for organizational activity (Fjeldstad et al. 2012).

Value-creating logic contained 3 items that were operationalized by Worren et al. (2002). The originally developed items dealt with the creation of business plans (business objectives) to generate value for customers by developing new market segments and building new products. The purposeful logic inherent in specifying business objectives carefully outlines the case for change by stating the value of implementation. In previous analysis, this three-item scale was valid and reliable. Furthermore, these items embodied the value-creating logic described by Jacobides (2010).

The third sub-dimension of strategic rationale, goal-directed activities, is comprised of 4 items. Powell (1992) operationalized goals into two categories: short-term and long-term. Short-term goals focus on the day-to-day and week-to-week activities necessary to adhere to the long-range plan (Williams, 2013). These items were contained in an overall composite measurement; however, the additional two items were not of interest to this study. The composite measure was found to be valid and reliable, while the individual items selected possessed factor loadings >0.70. The remaining two items were newly developed for this study, yet they reflect our theoretical understanding of developing and tracking goals.

Systems Integration

In Chapter 2, three sub-dimensions of systems integration were identified based on the theoretical arguments for modularity, interconnectedness, and system fitness context. The systems modularity sub-dimension is measured by a previously validated scale from Worren et
The measures for this sub-dimension were chosen for two primary reasons. First, the previously validated measures from Worren et al., (2002) contained specific sub-dimensions for modular structure, modular processes, and modular products. These items offer a robust account of system modularity at the organizational level, which is of interest in this study. Second, the scale was found to be reasonably reliable and valid for use in assessing modularity in organizations.

The measures for interconnectedness of principals and agents come from two validated scales. Jayachandran et al. (2004) builds on previously validated scales from Jaworski and Kohli (1993) and Li and Calantone (1998). The items chosen originally appeared in Jaworski and Kohli (1993) and have been subsequently refined by Li and Calantone (1998) and Jayachandran et al. (2004). Given the prior validation and reliability of the measures, four items were selected for inclusion in the present study.

System fitness is necessary to ensure that the management team has selected the appropriate capabilities to adjust. Measures from Liao, Kickul, and Ma (2009) were validated using two-step confirmatory analysis, which concluded that the model had discriminant and predictive validity. As a result, three items were selected to represent system context for the current investigation.

Eleven items were contextualized to measure system integration. As developed in Chapter 2, systems integration contains three sub-dimensions: modularity, interconnectedness, and system fitness. Modularity is comprised of four items, interconnectedness consists of four items, and system fitness includes three items.
Governance Structure

The development of governance structure yielded three sub-dimensions: hierarchical controls, contract design, and incentive alignment. Three items were adapted from Arend (2012), to represent hierarchical controls. This scale was chosen due to the emphasis it places on structure, the access within the structure, and how the hierarchy focuses on the outcomes associated with adaptation-based activities. In the analysis conducted by Arend (2012), the used scale was reliable and internally consistent.

Contract design is often viewed as a relationship between an external agent and a principal. Given the focus on interorganizational relationships, the contracts emphasized in this study may not necessarily be in the form of a formal written contract. Four items were adapted from Lusch and Brown (1996) and Aulakh and Gencturk (2008) to reflect agreement between interorganizational areas. These scales had internal consistency and reliability. Since the number of items was limited, the two scales were combined.

Incentive alignment represents how well goals and incentives are aligned to enable the delivery of DCs. Three items were adapted from Arend (2012) and Liao et al. (2009) for inclusion in this study. Two items describe how employees are evaluated and compensated (Arend, 2012). The third item inquires about “proper incentives” to motivate individuals (Liao et al., 2009) to achieve the stated objectives of the DCs. While the items were contained in validated and reliable scales, the context was different from the present study, which is why the three items were combined to represent incentive alignment.

Governance structure contained 10 items. The three sub-dimensions consisted of the following number of items: hierarchical controls (3 items), contract design (4 items), and
incentive alignment (3 items). A sample item of the scale is “We strongly emphasize getting things done by following formal processes and procedures.

Alignment of Ordinary Capabilities

To gain a better understanding of how ordinary capabilities align with one another, a measure of alignment between each ordinary capability is necessary. Venkataraman (1989) described several different categories of fit in strategic management research. In the context of this study, fit as internal consistency refers to the fit among theoretically related variables (Venkataraman, 1989). This study uses the term alignment to refer to the internal consistency portrayed by Venkataraman. More specifically, in Chapter 2, theoretical arguments and hypotheses were presented to describe alignment between ordinary capabilities. Yu-Yuan Hung, Chung, and Ya-Hui Lien (2007) used a similar approach to operationalize alignment between operational capabilities. Powell (1992) described the importance of aligning capabilities to achieve strategic goals. As presented in a previous chapter, each type of alignment consists of items for configuration and coordination.

The configuration sub-dimension of each alignment relationship contains four items, which focus on the specific strategic relationship that permit the organization to achieve its goals and objectives. Configuration was assessed based on how well teams from each area of ordinary capabilities worked with teams from other capability areas and if the capabilities teams had shared goals. These questions sought to specify the strategic relationship between the two ordinary capabilities by illustrating what the departments from the areas focused on (i.e. the development of new products) and if they were motivated with shared goals. The
configurational dimension of alignment also examines how closely the different capability areas worked together. A sample item from this scale is “Our customer facing teams work closely with our innovation teams to develop new customer solutions or resolve existing problems.”

The coordination sub-dimension of the respective alignment relationships contains four items that focused on how the two capability areas worked together. More specifically, coordination refers to how communication and information flows occur between the two capability areas. The coordination dimension of alignment placed emphasis on practices that facilitated the incorporation of new knowledge in the pursuit of goals and objectives. These questions assessed coordination between the departments of the respective capability area. A sample item from this scale is “There are interactive and integrated systems between our customer-facing teams (marketing, sales, and customer service) and operations teams (production, supply chain, and quality).”

Control Variables

There are a number of external factors that could influence an organization’s use of DCs. Barreto (2010) argues that small, medium, and large firms may use DCs to varying degrees. More specifically, understanding the conditions when the size of a firm matters, in the context of DC research, is important. Teece (2007) offers insight into two possible control variables. First, Teece (2007) argues that ‘entrepreneurial management’ is found in the skills and abilities of the managers and management team. He contends that experience with various facets of the organization and in management will influence entrepreneurial management processes. Teece also suggests that the age of the organization is relevant when assessing DCs because the
use of entrepreneurial management processes is not only unique to start-up firms. Pavlou and El Sawy (2011) controlled for firm size because they believed that smaller firms might be more innovative and capable of exacting change more readily than larger firms might. In other studies of capabilities, firm size was controlled for due the possible influence size may have on resource access, including access to capital, which may constrain capability change.

*Firm size* is measured with two items. Worren et al. (2002) operationalized firm size by counting the number of total employees. Lichtenthaler and Muethel (2012) controlled for firm size by taking the logarithm of the organization’s annual revenue. For this study, I will employ both measures because the revenue for some organizations may not be relevant (as in the case of a nonprofit or not-for-profit organization).

*Firm age* is measured by asking participants to respond to the following statement: “My organization has been in business approximately ____ years.” Categories will be established to classify organizations in the future. Past research suggests that older organizations may have more experience in instituting change. The number of decisions made and the frequency in which they are encountered may be reflected in the age of the firm. For instance, a company such as GE has made several decisions regarding its capabilities over time, when compared to a new company such as Skype. Therefore, a control variable is necessary to assess any undue influence.

*Individual experience* is measured by asking participants to indicate their total time with the organization. This will offer specific insight about the length of time an individual has with a given organization, which could influence knowledge about capabilities. Furthermore, an additional item, which targets the participant’s total years of experience, was added to account
for total years of experience in the field of expertise. The two measures are included to ensure that participant experience is appropriately represented.

*Individual position level* is measured by asking participants to state the level of their position with the organization. It is widely held in the DCs literature that managers and executives of organizations drive the use and development of DCs (e.g. Teece et al. 1997, Eisenhardt & Martin, 2000, Helfat et al., 2007, and Kor and Mesko, 2013). To account for non-manager or non-executive response, participants are required to state if they are an individual contributor, team leader, supervisor, manager, director, or executive.

**Sample**

Prior empirical studies on DCs have focused on organizations that are in highly dynamic environments (Danneels, 2010; Drnevich & Kriauciunas, 2011). However, recent theoretical arguments suggest that firms in non-dynamic environments may also use DCs in an attempt to respond to environmental changes. Ambrosini et al. (2009) specifically identify three categories of DCs where at least one category suggests incremental changes that may be viewed as changes that occur in a stable environment. Helfat and Winter (2011) argued for the inclusion of non-radical change, typically indicative of dynamic environments, on the agenda for future DC research. Given these calls for the evaluation of organizations in radical and non-radical environments, I do not confine this study to participants only working in highly dynamic environments. Since the pre-testing conducted in the pilot study will not involve an industry sample, it was deemed appropriate to use a convenience sample of working students to test the measures contained in the study.
Methodology

Given the exploratory developments of specific aspects of this investigation, a pilot study is necessary to minimize uncertainty of the research instrument. Pilot studies are often used to test and adjust the questionnaire to improve the comprehension of the items (Skulmoski, Hartman, & Krahn, 2007). Pilot studies also provide the researcher with the opportunity to identify and correct potential problems with the administration of the survey in the main study. This study will use a two-step pilot testing process for the first pilot study.

For the purposes of the pilot study, I used a paper-based survey to collect data. Prior to administering the survey, the developed instrument underwent evaluation from an academic expert panel (first panel) and a practicing expert panel (second panel).

Pre-Pilot Administration

The first step required two panels of experts to evaluate the questionnaire to identify potential issues with the items. The first panel consisted of three experts familiar with business survey research and the methodologies associated with field survey development. More specifically, each panelist has in-depth knowledge of the DC phenomenon or extensive knowledge of survey research. The experts serve on the dissertation committee for this study. The panelists conducted two tasks. First, they were instructed to evaluate the items used to measure the defined construct to determine if those items were appropriate to measure the given construct. Second, they assessed the items for clarity to determine if the wording used was clear and concise. Summarized feedback from the first panel is in Table 4.
I used feedback from the first panel to refine the questionnaire to minimize issues and errors with the second expert panel review. In total, 78 questions were identified for the survey.

The second panel consisted of five industry experts currently working for an organization. Expert panel 2 had extensive experience (as defined as 10 plus years of on the job experience) with organizational change initiatives. More specifically, the job titles of the individuals were Director of Change Management, Senior Process Design Manager, Vice
President of New Product Development, Director of Major Customer Accounts, and Managing Director of Consulting Services.

The instructions provided to the second panel were as follows:

Read and review the attached survey to determine if you understand what the instructions are asking of you as a participant. Please document any issues or possible questions. Also, review each set of questions to assess its ability to explain the defined phenomenon it is intended to explain.

Each participant also provided feedback regarding the level of employee they believed could reasonably answer each question given the individual’s title and responsibility within the organization. Written feedback from the second panel is shown in Table 5.

Instrument Refinement

Before administering the finalized survey to the targeted population, the feedback from the second expert panel was evaluated. Additional language was added to the instructions (whenever possible) to help clarify the directions for participants. For instance, the instructions for questions 1-12 initially read, “Please indicate your level of agreement with the statements below based on your perception of how well your organization reconfigures organizational processes to address changes in the environments relative to your industry.” The word “major” was placed before industry to address the primary industry that the organization competed in to help the participant who may work in an organization that deals with multiple industries better answer the question. This feedback stemmed from the second expert panel. Once the survey was revised based on feedback from the two panels, the final instrument contained 78 questions.
<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Instructions</td>
<td>- Instructions for 1-12 seem okay.</td>
<td>- Instructions for 1-12 mentions changes in your industry. What if multiple industries are served. Clarification may be needed.</td>
<td>- Instructions for 1-12 are okay.</td>
<td>- Instructions for 1-12 does &quot;reconfigure&quot; mean change?</td>
<td>- Instructions for 1-12 are “adequate”.</td>
</tr>
<tr>
<td></td>
<td>- Instructions for 13-41 require clarification of &quot;processes used&quot;, otherwise okay.</td>
<td>- Instructions 13-41 it is not clear where the changes take place</td>
<td>- Instructions for 13-41 need to address process type, otherwise okay.</td>
<td>- Instructions for 13-41 are sufficient to answer following questions</td>
<td>- Instructions for 13-41 are &quot;adequate&quot;</td>
</tr>
<tr>
<td></td>
<td>- Instructions for 42-60 the term capabilities may not have much meaning to associates who have only worked in one area.</td>
<td>- Instructions 42-60 are okay.</td>
<td>- Instructions 42-60 seem okay.</td>
<td>- Instructions for 42-60 are sufficient to answer following questions</td>
<td>- Instructions for 42-60 &quot;seem a bit vague.”</td>
</tr>
<tr>
<td></td>
<td>- Instructions for 61 – 69 are clear.</td>
<td>- Instructions for 61-69 are straight forward and clear</td>
<td>- Instructions 61-69 “alignment between capabilities” what does that mean?</td>
<td>- Instructions for 61-69 “does alignment refer to how well areas work together?”</td>
<td>- Instructions for 61-69 are adequate</td>
</tr>
<tr>
<td></td>
<td>- Instructions for 70-78 are clear.</td>
<td>- Instructions for 70-78 are okay.</td>
<td>- Instructions for 70-78 seem good.</td>
<td>- Instructions for 70-78 are sufficient</td>
<td>- Instructions for 70-78 are adequate</td>
</tr>
<tr>
<td>Content/ Purpose of Survey</td>
<td>- &quot;Survey appears to address how the different departments within the company implement changes to address shifts&quot;.</td>
<td>- &quot;Document questions how well internal departmental areas work with one another to meet business goals.&quot;</td>
<td>- &quot;Survey seeks to assess whether an organization has the tools to make changes when needed. It looks primarily at internal relationships between areas like marketing and engineering.&quot;</td>
<td>- &quot;Survey addresses how an organization manages change internally. It focuses on capabilities of different groups to see if they work together or against one another&quot;.</td>
<td>- &quot;Survey deals with how the organization uses its tools and resources to respond to competition or evolving events&quot;.</td>
</tr>
<tr>
<td>Survey Question Feedback</td>
<td>- Most questions are clear and straight forward. A few questions may require additional clarity. Examples of capabilities or processes could help. See marked questions&quot;.</td>
<td>- &quot;Employees may not be able to answer all questions for each area depending on his/her job responsibility. Question wording seems logical&quot;.</td>
<td>- &quot;Examples of different areas could help clarify some of the questions. Otherwise, most questions are okay.</td>
<td>- &quot;Questions seem sufficient to address the topic as I understand it. Examples where appropriate may be helpful&quot;.</td>
<td>- &quot;Questions are interesting and different, so associates should not have too much difficulty answering them&quot;.</td>
</tr>
<tr>
<td>Appropriate Level of Role to Answer Questions</td>
<td>- Professional individual contributors and higher</td>
<td>- Supervisor of hourly employees should be the lowest level and any role higher</td>
<td>- Any level of employee could answer, but answers may be better from professional employees</td>
<td>- Manager of professionals</td>
<td>- Experienced Professional Individual Contributors/ Managers</td>
</tr>
</tbody>
</table>
Due to the use of human subjects in this investigation, the appropriate materials (i.e. IRB application, informed consent form, survey instrument, and recruiting materials) were submitted to the institutional review board (IRB) for approval on 05/28/2013. The study received approval from IRB on 06/17/2013, which allowed the collection of pilot data to begin. The investigator solicited participation in the pilot study survey first through the instructor of record for 3000 level and higher undergraduate business courses, during the 2013 summer term. The instructor permitted the researcher to administer the survey during class time, where participants were solicited to complete the survey.

Research Design of Pilot Study 1

Upon the refinement of the questionnaire, step two of the first pilot test commenced. Step two of the first pilot test involves administering the survey to undergraduate students taking courses in the College of Business. This cross-section of students will consist of business and non-business majors enrolled in businesses courses for credit. The diversity of majors and demographics in the student population is expected to be similar to the diversity of potential survey participants that work in industry, which will be used in the main study.

Descriptive Statistics

Pilot study 1 data was analyzed utilizing various statistical techniques to understand the suitability of the research design and questionnaire for use in the main study. The use of descriptive statistics permitted the discussion of the following: the survey response rate, usable responses, and demographics of the participants. The survey response calculation will
determine if the response rate is in line with acceptable response rates for survey research.

The number of usable survey responses will be used in the calculation of response rate. A brief discussion on possible issues associated with non-response bias will follow. Descriptive statistics will also include demographic information on the participants.

Student participants from four summer classes of the 2012/2013 academic year completed the survey. The overall recruitment of students in these four classes yielded a total of 154 potential respondents. Instructors in each course announced the survey participation at the beginning of their classes. To increase the response rate for this study, all instructors offered to award extra credit to students who volunteered to complete the survey. The total amount of time used by the students to respond to the survey questionnaire was 15 minutes. Students who did not participate in the survey also had an opportunity to earn extra credit through an equally weighted, alternative assignment designated by the instructor. After administering the survey to four classes, 131 surveys were collected, yielding a response rate of 81.8%. The data was manually entered into Excel to initiate the data cleaning process. Surveys with nonrandom missing information, as determined in SPSS, were eliminated. Upon completion of the data cleaning process, 126 usable surveys were identified for further analysis.

An analysis of the demographic and classification variables indicates 41 percent of respondents were in management and 59 percent were individual contributors. Of this group, the average job tenure was 2.52 years and the average age of their respective firms was 28.2 years. The average job tenure (experience) for this group of respondents ranged from one to 12 years.
Exploratory factor analysis (EFA) was performed on the data collected to assess the reliability and validity of the survey instrument. The number of factors extracted was based on the eigenvalue being greater than one. Items with factor loadings greater than 0.5 were considered a satisfactory measure of a given construct (Hair et al., 2010). Items that measured specific domains of the organizational processes of dynamic capabilities construct were examined separately using principal component analysis with Varimax rotation; whereas, analysis of the factors for managerial processes and alignment were conducted in a separate single factor analysis.

Table 6
Descriptive Statistics and Factor Analysis of Organizational Processes

<table>
<thead>
<tr>
<th>Latent Variable with Items</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>EFA Loadings</th>
<th>% Variance Explained</th>
<th>Cronbach’s-α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing</td>
<td>4.85</td>
<td>1.45</td>
<td>0.86</td>
<td>45.23</td>
<td>0.89</td>
</tr>
<tr>
<td>DCOPSP3</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>DCOPSP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSP1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSP4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seizing/Reconfiguring</td>
<td>4.42</td>
<td>1.47</td>
<td>0.86</td>
<td>30.75</td>
<td>0.94</td>
</tr>
<tr>
<td>DCOPRP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSZ1</td>
<td></td>
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<td></td>
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<td>DCOPSZ2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPRP3</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSZ3</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>DCOPRP4</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>DCOPRP1</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

As indicated, separate EFA was performed on each construct. For the first order variables, items that were below the 0.50 level were suppressed, while items that cross-loaded were eliminated. The items representing the sub-dimensions of organizational processes of dynamic
capabilities consisted of sensing and a single factor that included items relating to sensing and reconfiguring, as shown in Table 6. The combined single factor of seizing and reconfiguring was not expected. However, upon closer review of the theory and a detailed evaluation of the items, the items will remain as separate sub-dimensions and changes in directions for participants are necessary for the subsequent pilot. The amount of variance explained by the factors of sensing and seizing/reconfiguring was 45.23 percent and 30.75 percent, respectively. In addition, the mean and standard deviation values ranged from 4.42 – 4.85 and 1.45 – 1.47, respectively. An acceptable minimum threshold value for Cronbach’s alpha is 0.7 (Hair et al. 2010). The sub-dimensions of the organizational processes of DCs (i.e., sensing, seizing/reconfiguring) reported Cronbach’s alpha values of 0.89 and 0.94 respectively. These values show that the items measuring the sub-dimensions have internal consistence.

However, the loadings for strategic rationale and governance structure more closely matched the intended focus of the developed sub-dimensions. The means for the two sub-dimensions ranged from 4.70 to 5.04, with standard deviations ranging from 1.18 to 1.22 respectively. For strategic rationale, the item loadings ranged from 0.55 to 0.82, with a Cronbach’s alpha of 0.89, suggesting that the sub-dimension is reliable. The item loadings for governance structure ranged from 0.63 to 0.83, with a Cronbach’s alpha value of 0.88, as shown in Table 7. Strategic rationale and governance structure explained 8.36 and 40.75 percent of the variance. All items with factor loadings of 0.5 and greater will be retained for the main study provided the items are reasonable representations of the focused definition.

Table 7 offers the descriptive analysis results from the EFA conducted for the newly developed construct Managerial Processes. In Chapter 2, I theorized that managerial processes
would contain three sub-dimensions: strategic rationale, systems integration, and governance structure.

Table 7
Descriptive Statistics and Factor Analysis of Managerial Processes

<table>
<thead>
<tr>
<th>Latent Variable with Items</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>EFA Loadings</th>
<th>Variance Explained</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Rationale</td>
<td>5.04</td>
<td>1.18</td>
<td>8.36</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>DCMPSR1</td>
<td></td>
<td></td>
<td>0.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPSR2</td>
<td></td>
<td></td>
<td>0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPSR5</td>
<td></td>
<td></td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems Integration</td>
<td>4.8</td>
<td>1.18</td>
<td>29.81</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>DCMPSI8</td>
<td></td>
<td></td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPSI7</td>
<td></td>
<td></td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPSI6</td>
<td></td>
<td></td>
<td>0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governance Structure</td>
<td>4.7</td>
<td>1.22</td>
<td>40.75</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>DCMPS6</td>
<td></td>
<td></td>
<td>0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPS7</td>
<td></td>
<td></td>
<td>0.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPS8</td>
<td></td>
<td></td>
<td>0.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPS9</td>
<td></td>
<td></td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPS10</td>
<td></td>
<td></td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPS11</td>
<td></td>
<td></td>
<td>0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPS4</td>
<td></td>
<td></td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCMPS5</td>
<td></td>
<td></td>
<td>0.71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Each sub-dimensions contained between 9 and 11 items for a total of 30 items. The EFA for managerial processes retained 25 of the initial 30 items, resulting in three factors as theorized in Chapter 2. However, the item loadings yielded three items for strategic rationale, 14 items for systems integration, and 8 items for governance structure. Upon closer evaluation of the strategic rationale and systems integration items, it was determined that several of the initial items did not match well with the original definition and theorized development of each sub-dimension. For instance, strategic rationale identifies the overall purpose of the capability and does not directly deal with a business plan or specific goals. In the case of systems integration, the intent of the theoretical developments were to describe the value of modularity and adaptability of a capability, not focus on how decisions were made or whether or not departments worked closely together. As a result, several items loaded together, which do not offer a concise representation of the theoretical developments. Additional refinements are necessary to represent the intended focus of these dimensions.

Table 8
Descriptive Statistics and Factor Analysis of Alignment

<table>
<thead>
<tr>
<th>Latent Variable with Items</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>EFA Loadings</th>
<th>% Variance Explained</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer-Innovation</td>
<td>4.3</td>
<td>1.65</td>
<td>0.86</td>
<td>31.94</td>
<td>0.90</td>
</tr>
<tr>
<td>ALCCIC1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALCCIC2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer-Operational</td>
<td>4.54</td>
<td>1.51</td>
<td>0.86</td>
<td>28.72</td>
<td>0.89</td>
</tr>
<tr>
<td>ALCCOC2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALCCOC3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation-Operational</td>
<td>4.54</td>
<td>1.45</td>
<td>0.80</td>
<td>30.75</td>
<td>0.86</td>
</tr>
<tr>
<td>ALICOC2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALICOC3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 8 provides a descriptive analysis and factor analysis of the theorized alignment dimensions. The intent of these dimensions was to assess how well capability areas “fit” or “matched” with one another, while working together. Given this, each of the dimensions contained three items. The theoretical developments of these dimensions suggest identify three dimensions of alignment. The initial factor structure identified a single factor of alignment. Due to the close nature of the questions asked and the expected interaction effect estimated between the three different capability areas, a priori criterion permitted the specification of three factors for purposes of statistical analysis in SPSS 21.

The mean for customer-innovation capability alignment was 4.3 with a standard deviation of 1.65. Two of the three items loaded with EFA loadings of 0.868 and 0.825. Customer-innovation capability alignment described 31.94 percent of the variation present with a Cronbach’s alpha of 0.90, representing the highest reliability among the alignment dimensions. Mean and standard deviation for customer-operational capability alignment were 4.54 and 1.51. Due to cross-loadings, two of three items loaded with EFA loadings above 0.5 at 0.865 and 0.82. The percent of explained variance was 28.72, while the Cronbach’s alpha score was 0.89 suggesting that the dimension is reliable. From Table 8, innovation-operational capability alignment yielded a mean and standard deviation of 4.54 and 1.45. EFA analysis identified two items with loadings of 0.803 and 0.799. The amount of variance explained by innovation-operational capability alignment was 30.75 percent and the Cronbach’s alpha was 0.86.

In summary, descriptive statistics and EFA analysis suggests that instrument designed is reliable and suitable for research of the desired area. However, there were numerous
opportunities to improve the instrument noted in Instrument Refinement section following the section on power analysis. The noted improvements will bring clarity and depth to the survey instrument that will be examined in a second pilot study.

**Power Analysis**

To determine the targeted sample size, Hair et al. (2010) recommends a power value of 0.80 or higher, for an alpha level of 0.05 with a suitable effect size for small (0.20), medium (0.50), or large (0.80). Failure to obtain an appropriate sample size may lead to inaccurate results that may adversely influence the findings from the study. Given this, to obtain a significance level of 0.05 with a minimum $R^2$ of 0.10, the minimum sample size must be greater than 124. The sample for this pilot yielded 126 usable surveys, which is greater than the minimum samples needed to determine the desired significance.

**Instrument Refinement**

While the deployed survey instrument accomplished the initial objective for this study, the study could benefit from improvements to the final instrument. For instance, in lieu of general directions for each of the three constructs of interest (organizational processes, managerial processes, and alignment), the survey was altered to offer specific directions for each sub-dimension for each construct. In the case of organizational processes, the initial survey contained one set of directions for the organizational processes of sensing, seizing, and reconfiguring. The refined survey contains directions for each sub-dimension of organizational processes to help the participant distinguish between the questions asked. For managerial
processes, the creation of specific directions for strategic rationale, systems integration, and governance structure were necessary. For alignment, explicit directions coupled with examples of departments within capability areas attempt to reduce the ambiguous nature of generic directions.

Based on revised definitions for each of the main constructs and sub-dimensions, items were removed to reflect the refined definition. In the case of managerial processes, the number of items declined from an initial 30 to 20 items with a minimum of four questions for each sub-dimension. For alignment, additional items reflected the interest in assessing the strategic (configuration) and tactical (coordination) aspects of alignment for each of the three capability areas of interest. Each capability alignment now contains eight items for evaluation purposes.

Given the possible influences of the participant’s perspective on study variables, gender, race, and educational level questions were added to the survey. These additional items will add depth to future analysis to determine and control for factors that influenced similar studies.

Overall, the refinement process deleted 10 prior items and added 18 new items, for a net increase of 8 items. The refinements to the directions and questions will provide clarity for the participant. As a result, of these changes, a revised survey and modification request was submitted for internal review board approval on 12/11/2013. The Institutional Review Board approved the changes and modification request for Human Study Application #13-313 on 12/17/2013. Subsequently, the next phase of the study is ready for execution.
Research Design of Pilot Study 2

Given the refinements and addition of new items to the survey instrument used in Pilot 1, I conducted a second pilot study. The second pilot study data was analyzed to determine if the revisions from the first pilot improved the instrument and provided greater clarity to the participants. The refinements identified during the second pilot were used to create the final instrument, which was deployed to industry participants in the main study.

The primary difference between the first and second pilot studies were the participants used in each study. The second pilot study identified 60 potential respondents currently in industry to complete the survey. The participants worked at seven different companies from two different industries. The participants worked in areas closely associated with enterprise-level change initiatives for each of their respective organizations. Each participant was instructed to complete the survey based on their knowledge regarding their organization. They were also asked to provide feedback regarding what they believed each question section asked. In addition to these instructions, the initial 60 participants were given the opportunity to share the survey with a coworker to be completed by the coworker.

Of the initial 60 participants identified, 52 completed the survey. Of the 52 that completed the survey, 14 respondents shared the survey with one or more coworkers, which yielded an additional 24 completed surveys. In total 76 surveys were returned. Based on feedback from the 14 participants who shared the survey with a coworker for completion, it was determined that the survey was shared with an additional 41 participants. Given this, the estimated response rate for this survey is 75.24 percent (76 surveys received/101 possible participants). The average amount of time used by industry participants to respond to the survey
questionnaire was 22 minutes. The data was manually entered into Excel to initiate the data cleaning process. Surveys with nonrandom missing information, as determined in SPSS, were eliminated. Upon completion of the data cleaning process, 71 usable surveys were identified for further analysis.

An analysis of the demographic and classification variables indicates that 48 percent of respondents were in management and 52 percent were individual contributors. Of this group, the average job tenure was 6.79 years and the average age of their respective firms was greater than 37 years of operation. Approximately 54 percent of the participants were female and 46 percent were male. More than 90 percent of the sample possessed at least a bachelor’s degree and approximately 53% possessed a graduate degree. In the second pilot study, the three elements of organizational processes emerged. Given the loadings from the first pilot study, confirmatory analysis yielded the results in Table 9.

Confirmatory factor analysis (CFA) was conducted on the measurement model to assess the consistency, reliability, and construct validity (Gefen and Straub, 2005). In assessing loadings of the measurement items that corresponded to its theoretical anticipated factor, I retained measurement items or manifest variables that loaded with significant t-value on its respective latent variable at the 5% significance level. Measurement items with t-values that did not meet the 5% significance level were eliminated. Hence, only items that met the 5% significance level cut-off point were retained, indicating the presence of convergent validity with the measurement instrument (Gefen and Straub, 2005). Likewise, the same approach was used to confirm convergent validity. Indicator variables that had t-values significant at the 5% significant level will be retained for further analysis and use in the main study.
### Table 9

Second Pilot Study Descriptive Statistics and Factor Analysis of Organizational Processes

<table>
<thead>
<tr>
<th>Latent Variable with Items</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>EFA Loadings</th>
<th>% Variance Explained</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing</td>
<td>4.73</td>
<td>1.52</td>
<td>0.91</td>
<td>32.17</td>
<td>0.95</td>
</tr>
<tr>
<td>DCOPSP1</td>
<td></td>
<td></td>
<td>0.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSP3</td>
<td></td>
<td></td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSP2</td>
<td></td>
<td></td>
<td>0.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSP4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seizing</td>
<td>4.16</td>
<td>1.35</td>
<td>0.94</td>
<td>30.56</td>
<td>0.94</td>
</tr>
<tr>
<td>DCOPSZ1</td>
<td></td>
<td></td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSZ2</td>
<td></td>
<td></td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPSZ3</td>
<td></td>
<td></td>
<td>0.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reconfiguring</td>
<td>4.58</td>
<td>1.34</td>
<td>0.90</td>
<td>24.74</td>
<td>0.93</td>
</tr>
<tr>
<td>DCOPRP4</td>
<td></td>
<td></td>
<td>0.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPRP2</td>
<td></td>
<td></td>
<td>0.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPRP4</td>
<td></td>
<td></td>
<td>0.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCOPRP3</td>
<td></td>
<td></td>
<td>0.85</td>
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<td></td>
</tr>
</tbody>
</table>

### Table 10

Confirmatory Analysis Results for Organizational Processes

<table>
<thead>
<tr>
<th>Construct/Element</th>
<th>Item</th>
<th>t-Value</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing</td>
<td>SP1</td>
<td>21.68 (**)</td>
<td>0.91</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>SP2</td>
<td>32.68 (**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SP 3</td>
<td>38.21 (**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seizing</td>
<td>SZ1</td>
<td>52.34 (**)</td>
<td>0.93</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>SZ2</td>
<td>51.80 (**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SZ3</td>
<td>48.64 (**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reconfiguring</td>
<td>RP1</td>
<td>38.10 (**)</td>
<td>0.89</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>RP2</td>
<td>58.42 (**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RP3</td>
<td>41.06 (**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RP4</td>
<td>42.74 (**)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discriminant validity of the measurement instrument was shown to be present with all latent variables exceeding the AVE cut-off value of 0.5 (Fornell and Larcker, 1981). AVE measures the variance captured by a latent variable. In other words, it captures the amount of variance explained by the latent variable. The AVE values of the null model for organizational
and managerial processes ranged from 0.57 – 0.88. To further demonstrate that the latent variables had discriminant validity, the square root of the AVE values exceeded the correlation of a specific latent variable with any other latent variable in the hypothesized model (Hulland, 1999; Barclay, Higgins, and Thompson, 1995).

Composite reliability (CR), which assesses the reliability of the measures, had values above the 0.7 threshold point (Chin, 1998). Composite reliability assumes that indicators have different loadings and prioritizes indicators that have high reliability to the latent variable, unlike Cronbach’s alpha assumes that all indicators are equally reliable to the latent variable. The CR values for the measures in both samples exceeded this 0.7 cut-off point (see Tables 10 and 11). The results from the confirmatory analysis of the organizational and managerial processes suggest that the measurement instrument is suitable for use with industry professionals, which is the targeted sample in the main study.

Given the new items added to the alignment constructs, additional exploratory analysis was needed to assess the most recent conceptualization of the alignment constructs. Additional items were added to the existing configuration-related items to encompass the coordination aspects of alignment. The additional items yielded a total eight items for each alignment construct.

Table 11
Confirmatory Analysis Results for Managerial Processes

<table>
<thead>
<tr>
<th>Construct/Element</th>
<th>Item</th>
<th>t-Value</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Rationale</td>
<td>SR1</td>
<td>6.05 (**)</td>
<td>0.84</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>SR2</td>
<td>30.27 (**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SR6</td>
<td>17.42 (**)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The mean for customer-innovation capability alignment was 4.96 with a standard deviation of 1.15. Four of the eight items loaded together with EFA loadings ranging from 0.74 to 0.81. Customer-innovation capability alignment described 20.65 percent of the variation present with a Cronbach’s alpha of 0.85, representing the lowest reliability among the alignment dimensions. Items for both the configurational and coordination elements of alignment were represented in the four items, which loaded above 0.50. Four of the eight original items were not retained due to loadings below 0.50 and cross loadings. Based on feedback from survey participants, the examples for the different types of alignment seemed similar, which could help explain the cross loadings. In the main study, further steps will be taken to minimize this issue.

Table 12

Second Pilot Descriptive Statistics and Factor Analysis of Alignment
Mean and standard deviation for customer-operational capability alignment were 4.72 and 1.23. Due to cross-loadings, four of eight items loaded with EFA loadings above 0.5 ranging from 0.72 and 0.86. The percent of explained variance was 20.77, while the Cronbach’s alpha score was 0.90 suggesting that the dimension is reliable. There was representation of both elements of alignment, where three items loaded for configuration and one item loaded for coordination. Four of the eight items did not load to cross loading and failure to load at 0.50 or greater.

From Table 12, innovation-operational capability alignment yielded a mean and standard deviation of 4.89 and 1.16. EFA analysis identified eight items with loadings ranging from 0.72 and 0.81. The amount of variance explained by innovation-operational capability
alignment was 34.06 percent and the Cronbach’s alpha was 0.94, both of which represent the highest amount of variance explained and the highest Cronbach’s alpha score among the alignment constructs. While six of eight of the original items designated to represent innovation-operational capability loaded, two items associated with customer-operational capability alignment also loaded. One of the original innovation-operational alignment items loaded with customer-operational capability alignment and the other original item did not meet the threshold of 0.50, and was eliminated.

In summary, descriptive statistics and EFA analysis suggest that the instrument designed is reliable and suitable for research of the desired area. However, there were opportunities to improve the instrument noted by industry survey participants. The noted improvements will refine the questions/statements included in the survey by providing clear examples of the different types of capability alignment. These changes will reduce confusion resulting from similarly phrased questions/scenarios. These changes will be incorporated in the main study survey prior to distribution.

By using a single-respondent response, it is necessary to assess variance introduced to the study via the chosen method. Common method variance exists when systematic variance is introduced in the measure because of the measurement technique employed. Podsakoff and Organ (1986) suggested the use of statistical tools to assess the amount of variance represented from one factor to determine the presence of common method variance. From this perspective, no one factor should account for the majority of the variance explained. In the context of the measurement scale design, the use of scales from multiple sources and the refinement efforts from the expert panel feedback will also help to minimize common method variance.
variance. As seen in Tables 9 and 12, no one factor explains a majority of the variance. Given this, the presence of common method bias is not likely.

Main Study

*Research Design Enhancements*

To improve the overall quality of the results contained in the main study, several steps were taken to enhance the research design of the main study. Based on feedback received from Pilots 1 and 2, revisions of the terminology were necessary to reflect a more practical sense of the construct under evaluation. Furthermore, each section contained revised directions to specify the content that would follow. The purpose of the new directions was to establish context for the participant to answer the proceeding questions. Where appropriate, specific examples or reflective scenarios were given to the participants to illustrate the content in question.

In addition to the enhancements of the terminology and directions, the format and administration procedures of the main study changed. The format of the survey for Pilots 1 and 2 were paper-based and electronic-based (email) surveys. While Pilot 2 was administered via email, the completed surveys were printed and scanned or mailed in for analysis. The purpose of this type of deployment was to improve the response rate and obtain direct feedback from participants to improve the overall study. To reach the targeted audience, the main study used an online version of the survey, which was developed and deployed via Qualtrics. Given the targeted audience of working professionals, it was appropriate to move to an online format of the survey to better reach the targeted audience.
Deploying a Qualtrics survey permitted forced participant responses before they could proceed in the survey, which means each question required an answer before advancing to the next one. This enhancement eliminated missing data issues for each of the constructs of interest. It also automated data collection to avoid manually entering data, as done in Pilots 1 and 2, which subsequently reduces data entry errors.

Given the difficulty in receiving responses from business professionals and the low response rates associated with online surveys, the main study was administered by the Qualtrics Panels team. As a company, Qualtrics provides the software used to host online surveys. Qualtrics may also provide services that assist researchers with locating research participants for a fee. In exchange for their participation, Qualtrics offers participants compensation by earning points or credits to purchase products and services from online merchants (Dumas, Phillips, and Rothbard, 2013). Potential participants were identified through a database of individuals who had previously agreed to participate in studies for Qualtrics. Qualtrics prescreened based on the criteria and characteristics sought by the researcher. The participants that met the screening qualifications were emailed the link to the main study.

The use of a third party servicer for facilitating survey administration and data collection in the social sciences is not new, but in the traditional business disciplines (i.e., marketing, management, and accounting), adoption has been slow. Qualtrics purports that the use of their survey administration and data collection services is beneficial to researchers in a number of ways (Qualtrics, 2013), three of which are of primary relevance to this research project. First, the process utilizes randomization, which is sometimes difficult to achieve in field survey work.
Potential participants are randomly selected from a database of more than six million adults, ages 18 years and older. Second, the researcher can specify the criteria desired in the participant pool. In a recent *Organization Science* article, Dumas et al. (2013) utilized the Qualtrics Panel services to administer a two-step survey that specified 25 percent of the sample must include participants from underrepresented minorities. An article from Long, Bendersky, and Morrill (2011), in the *Academy of Management Journal*, utilized Qualtrics to identify, administer, and collect data from respondents that met their specific employment restrictions. The ability to specify the characteristics of a targeted sample allows the researcher to make observations that may not be possible utilizing traditional randomized survey administration and data collection techniques. Third, researchers at the University of California – Los Angeles (UCLA), used Qualtrics to reduce time to collect, sort, and analyze data by 50 percent (Qualtrics, 2013). Researchers from the UCLA Anderson School of Management support claims that the use of Qualtrics has reduced data collection errors, resulting in an increased publication rate (Qualtrics, 2013).

To begin, each project is assigned a project manager, who is responsible for launching and monitoring the survey in the field. Prior to a full launch, 10 percent of the desired number of participants is surveyed. The project manager and the researcher review the results from the “soft launch” to identify any problems associated with the data collection procedure. If issues are identified, they are resolved before a “full launch” occurs. Once the full launch occurs, the Qualtrics project manager monitors the results and conducts quality checks to ensure the quality of the data is not compromised. The emphasis on quality data has merit to both academicians and working professionals. As top business journals such as *Organization
Science, Academy of Management Journal, Industrial Marketing Management, and the Journal of Interactive Marketing (see Dumas et al., 2013; Long, Bendersky, and Morrill, 2011; Obal, 2013; and Jimenez and Mendoza, 2013) publish papers utilizing Qualtrics services or those similar, doubts about the quality or reliability of the data will decline.

Data Collection Procedure

The results from the two pilot studies indicated that the variance in the data could stem from differences in participants’ experience and job classification. Given this, the sample for the main study needed further specification. To qualify for the study, participants needed to: work full-time in a professional (salaried) position, possess 5 years or more experience as a full-time, salaried-professional, work in a customer, operations, or innovation-oriented job, and work in either manufacturing, technology, financial services, health care, or real-estate/construction related industries. Arguments exist for the presence of DCs in high growth/high change industries (Teece, 2007) and in low growth/low change industries (Helfat and Winter, 2011). As a result, the specification of the targeted industries seemed appropriate. An answer of “No” to any one of the aforementioned screening questions associated with these requirements disqualified a potential participant from the study.

Upon qualification to participate in the study, the participant received an email directing him/her to an online link for the main study survey. To evaluate the procedure and data quality prior to a full launch, a soft launch of the survey ensued. Qualtrics collected approximately 10% of the desired number of responses to evaluate the procedure and data quality. The evaluation of the soft launch data revealed low completion times for approximately 32% of the survey.
Based on times to complete the survey in the two pilots, the average completion time was 13 minutes. Given the format change from paper-based to online, a convenient sample of 21 PhD students and working professionals, unfamiliar with this study, was administered the survey in Qualtrics. The results suggested that the average time to complete the survey online is about 9 minutes and 32 seconds. However, three of the 21 participants had never completed a survey online, skewing the results. This information was communicated to the Qualtrics Panel Project Manager and a new filtering criterion was added. Surveys completed in less than six minutes were eliminated due to quality concerns. Data collection for the main study began on 04/24/2014 and concluded on 05/02/2014.

Data Evaluation

Prior to analyzing the data for empirical testing, the data was evaluated for possible errors using SPSS 21. During the inspection of the data, errors were noted in the ranges of values for sensing, customer-operational capability alignment, and innovation-operational capability alignment. In the case of sensing, the incorrect values ranged from 14 – 20. The correct range for these variables was 1 – 7. After identifying the range, the completed online surveys were checked to validate the correct value for each item. For the alignment items, the incorrect values ranged from two to nine. Values of eight and nine were incorrectly recorded for survey values of six and seven, respectively. No other errors were detected with the raw data. Given this, the next step was to assess the corrected data for missing values.

Utilizing an online Qualtrics survey provided an option to minimize missing data. Unlike paper-based surveys where participants may be able to skip or unintentionally omit a response
to a question, Qualtrics allows the researcher to force a response to each question. Before the participant advances to the next page, all questions require an answer. The force response function eliminated missing values for the constructs of interest in this study. Next, the data was assessed for normality.

To assess the data for normality, skewness and kurtosis of the variables was assessed. Skewness values describe the symmetry of the distribution. Kurtosis offers information about the “peakedness” or “flatness” of the distribution (Hair et al., 2010). In an ideal normal distribution, the skewness and kurtosis values would be zero. Upon inspection, the distributions exhibited skewness typical of using Likert scales. However, the distributions did appear to be normal. However, Tabachnick and Fidell (2007) note that the risk of nonnormality is reduced in samples of more than 200, which in this study, the targeted sample size is 250. The underlying assumptions of PLS-SEM are not founded in the traditional multivariate assumptions where normality is required (Hair et al., 2013). Therefore, with a sample size greater than 200 and the use of a nonparametric technique to test the research model, the data collected for this study is suitable for further analysis.

Final Sample

Qualtrics estimates that approximately 18,017 individuals qualified for the study after the pre-screener process was complete. Approximately 995 qualified respondents opened the main study survey. Of the 995 that opened the main study survey, the attention filter eliminated 203 responses. Qualtrics recommends the use of attention filters to improve the quality of the data. An attention filter instructs the respondent to select a specific answer
choice, as selected by the researcher. The purpose of this process is to avoid straight lining or random guessing in the survey process. It provides the research a reasonable means to ensure the respondent is reading each statement or question. Three attention filters were used and failure to answer any one of the three, resulted in the removal of a respondent from the study.

Three hundred eighty-four respondents were eliminated because they did not work full-time, were not salaried employees, or did not work in a customer-related, innovation-oriented, or operations-related job. Given the focus of this study, findings from pilot studies 1 and 2 suggested full-time employees that work in the specific areas of interest would be better suited to answer the detailed questions contained in the survey. In addition, 26 respondents were eliminated because they have less than five years of experience as a salaried professional. Based on pilots 1 and 2, years of experience could influence a respondent’s answer choices because of his or her knowledge of the firm or industry.

Of the 995 respondents that opened the main study survey, 252 respondents participated in the study. However, upon further inspection of the data from these respondents, an additional seven respondents were eliminated from the study due to straight-lining. These seven correctly answer the three attention filters, but all of the other study variables were a single number across each item in the survey. This yielded 245 viable respondents for the study, which yielded a response rate of 24.6 percent. This is consistent with overall expected participation rates in online/internet research (Cook, Heath, and Thompson, 2000). Further, Hair et al. (2013) recommend that researchers using PLS structural equation modeling obtain a sample size of 189 for a construct with nine arrows pointing at it. This sample size is based on a statistical power of 80% to detect a 0.05 significance level with a
minimum $R^2$ of 0.10. Thus, the response rate obtained for this study is within range and the
data is deemed sufficient for empirical analysis.

The targeted respondents for this study were full-time, salaried professionals with a
minimum of five years of professional experience working in a customer, innovation, or
operations-oriented job. Working professionals with these criteria possess knowledge of how
the firm uses its capabilities to remain competitive because, in many instances, the job
requirements of these professionals require executing the tasks and strategies prescribed by
organizational leaders to remain competitive. They possess intimate knowledge of how well
the areas of interest work with one another. One hundred twenty-seven (58 percent of the
respondents) had direct reports, while the remaining 118 (42 percent) were individual
contributors, as shown in Figure 8.

In order to participate in this study, five years of professional experience was required.
While the professional experience may be with their current firm, it is possible that the
previous experience as a professional could come from other industries or in some cases, from
multiple firms. Given the focus of the present study on the respondent’s current firm,
respondents were then asked to provide the years of experience with their current firm. The
purpose of this is to control for knowledge of the internal workings of the current firm. It is
possible that an experienced professional may be a new employee at the current firm, which
could result in a lack of understanding as to how the firm operates in the areas of interest for
this study. As shown in Figure 9, 77 of the respondents had less than 5 years of experience with
their current firm. Of the remaining 168 respondents, 70 had six to nine years of experience, 67
had 10 to 19 years of experience, and 31 had more than 20 years of experience with their current firm.

While individual characteristics of the respondents are important, firm characteristics, in particular the age and size of the organization are equally important because they offer insight into resource availability and adaptability to keep pace with changes in the environment. For instance, firms that have a long operating history have likely experienced many different changes during its tenure. As a result, older organizations have experience in adjusting their capabilities to manage change. This “practice” coupled with the organization’s longevity, serves as a proxy for the organization’s ability to compete over time. Given this, respondents provided the age of their organization. Five firms had less than five years of operation. A majority of the firms (131) operated for more than 26 years, while 109 firms were between six and 25 years of operation. Figure 10 depicts a graphical illustration of firm age distribution.

Firm size offers insight into the scope of the firm. Firms with a greater number of capabilities require more resources (employees, revenues, etc.). In other words, small firms may lack the resources needed to constantly build and reconfigure capabilities because of possible capital or knowledge resources. Therefore, respondents were asked to provide the estimated number of people the firm currently employees. Respondents were asked to report their firm’s annual revenue as well. Due to several incomplete and inconclusive entries provided for annual revenue, annual revenue will not be used in this study as a proxy of firm size. Thirty-eight of the 245 firms had fewer than 49 employees, while a majority of the firms, 196 in total, had more than 50 employees. Figure 11 contains the specific details of firm size by the number of employees.
Figure 8

Professional Position Level of Respondents

![Pie Chart: Professional Position Level]

- Executives, 17, 7%
- Directors, 28, 11%
- Managers, 71, 29%
- Team Leaders, 32, 13%
- Supervisors, 26, 11%
- Individual, 71, 29%

Figure 9

Years of Experience with Current Firm

![Bar Chart: Years of Experience with Current Firm]

Number of Respondents:
- 0 - 5
- 6 - 9
- 10 - 19
- 20 - 29
- 30 - 39
- 40 - 49

133
Figure 10

Firm Age

Figure 11

Firm Size
In summary, the demographic information suggests that the targeted respondents for the study participated in the study. Working professionals with more than five years of experience as a full-time salaried professional were well prepared to answer questions about their firm’s organizational capabilities. The majority of the respondents worked more than five years at their current firm, which provides additional support that the respondents were well-equipped to answer complex questions regarding their firm’s capabilities. The demographic information also suggests that a majority of the respondents worked in companies with greater than 100 employees that had been in operation for ten or more years. This suggests that the respondents worked for companies that have likely experienced varying degrees of change that could warrant capability changes. Given this information, the responses collected seem appropriate for further analyses.

**Partial Least Squares – Structural Equation Modeling**

In Chapter 4, the research questions and subsequent hypotheses are examined using partial least squares structural equation modeling (PLS-SEM). PLS-SEM is a technique used to maximize the explained variance of dependent latent constructs (Hair, Ringle, and Sarstedt, 2011). Covariance-based structural equation modeling (CB-SEM) is different from PLS-SEM because it focuses on estimating a set of model parameters that seeks to minimize differences between the theoretical covariance matrix and the estimated covariance matrix (Rigdon, 1998). Therefore, CB-SEM is more appropriate for confirming existing theory. PLS-SEM, on the other hand is more appropriate for theory building and prediction (Henseler et al., 2014). PLS-SEM
allows the researcher to assess measures and the relationships among latent constructs. Given this, PLS-SEM is appropriate for analyzing the data at hand.

A two-step approach was used to assess the data. First, before the structural paths were estimated, it was necessary to assess the measures and determine if they were appropriate for use in the structural models, this is also referred to as the outer model. The outer model is comprised of the indicator variables and the latent constructs. The indicator variables are unidirectional and represent a predictive relationship with the latent construct. For this reason, multiple relations between indicator variables and different constructs are not permitted (Hair et al., 2011).

To determine if the outer model is acceptable, each item and each latent construct are checked for reliability and validity. More specifically, internal consistency is assessed with Cronbach’s alpha and composite reliability. Whereas, convergent and divergent validity are evaluated with average variance extracted (AVE) and by comparing the square root of the AVE values with latent variable correlations respectively.

**Internal Consistency Reliability**

There are two primary means to assess internal consistency reliability. The traditional criterion for internal consistency in multivariate analysis is Cronbach’s alpha. Cronbach’s alpha assesses internal consistency by assessing the intercorrelations of the observed variables. This analysis assumes that each indicator is equally reliable, which means that each indicator has the same outer loading on a given construct. In other words, an indicator with a 0.50 loading and one with a 0.90 loading carry the same weighting on the construct, which could lead to
underestimating the internal consistency reliability (Hair et al., 2013). It essentially identifies the indicators that “hang together” based on intercorrelations. The resulting alpha score ranges from 0 to 1, where a higher value suggests that a group of indicators are highly correlated with one another. Values above 0.70 are ideal. Due to its limitations in possibly underestimating internal consistency reliability, Cronbach’s alphas may be used as a conservative measure of internal consistency reliability.

PLS-SEM assesses internal consistency reliability by accounting for the different loadings from each of the indicators. It prioritizes the indicators based on each individual indicator’s reliability. This measure of internal reliability consistency is composite reliability (CR). Unlike Cronbach’s alpha, composite reliability takes the loadings of each indicator and weights the indicator’s contribution to the construct based on its own reliability. Composite reliability ranges from 0 to 1, where higher values generally reflect higher reliabilities. Values between 0.70 and 0.95 are ideal.

Convergent and Divergent Validity

Convergent validity refers to the extent in which a measure positively correlates with other measures of the same construct (Kerlinger and Lee, 2000). One way to assess the convergent validity of a measure is to inspect the factor loadings to determine if the indicators converge or share a high proportion of the variance (Hair et al., 2013). In PLS-SEM, researchers first examine the outer loadings of the indicators to assess individual indicator reliability. Typically, outer loadings of 0.70 are desirable because this suggests that the latent variable explains at least 50 percent of the indicator’s variance (Gefan and Straub, 2005). Indicators
with outer loadings below 0.40 are not reliable and should be removed from the analysis (Hair et al., 2011).

Average variance extracted (AVE) measures the explained variance captured by a latent variable or construct. More specifically, the AVE assessment suggests that the correlation of the construct with the indicators should be greater than its correlation with other constructs (Gefan and Straub, 2005). As a rule of thumb, AVE should be at least 0.50 (Fornell and Larcker, 1981). If an AVE is less than 0.50, the researcher should consider that more error resides in the indicators than the amount of variance explained by the construct, which is not ideal. AVE is a common means to assess convergent validity at the construct level (Hair et al., 2013).

To ensure that the constructs in the study are truly distinct from one another, it is necessary to assess discriminant validity. Testing discriminate validity will establish the uniqueness of the constructs of interest. Two measures of discriminant validity will be employed. First, the cross loadings of the individual indicators will be examined to ensure that the indicator’s outer loading on the associated construct is greater than the loadings or cross loadings on other constructs. This measure of discriminate validity is considered to be more liberal, and therefore, a second measure of discriminate validity is necessary.

The second measure of discriminate validity uses the Fornell-Larcker criterion (Hair et al., 2013). More specifically, this measure compares the square root of each construct’s AVE with the construct correlation matrix to ensure that the square root of the AVE is higher than any one correlation with another construct. In other words, this measure of discriminant validity assesses whether or not the variance explained by a given construct and shared with its indicators is greater than any one correlation with another construct.
Upon establishing internal consistency reliability and convergent and divergent validity, the second step in the two-step approach to assessing the data involves assessing the structural model. To assess the structural model relationships (i.e. test hypotheses), the path coefficients are examined. Path coefficients have standardized values that range from -1 to +1. Path coefficients near -1 or +1 represent strong negative or positive relationships. As the coefficients approach zero, the relationships are weaker. However, to determine if the path coefficients are significant, a bootstrapping method is employed to assess the standard error. PLS-SEM does not assume that the data follows a normal distribution and therefore, parametric significance tests are inappropriate to evaluate the significance of path coefficients (Davison and Kinkley, 1997). Bootstrapping uses a large number of subsamples from the original sample with replacement in a way that observations are randomly selected from the sampling population. Before the next observation is drawn, the randomly selected observation is returned to the sampling population (Hair et al., 2013). Bootstrapping calculates the t-values for each path. In order for the path coefficient to be significant, the calculated t-value must be greater than the critical value. Critical values for a two-tailed test are as follows: 1.65 (significance = 10%), 1.96 (significance = 5%) and 2.57 (significance = 1%). In the next chapter, these techniques are used to evaluate the suitability of the outer model and test the hypotheses posed by the questions.

Summary

In summary, this chapter described the methods used to collect and evaluate the data, which will be used to test the address the research questions posed in Chapter 1 and test the
hypotheses outlined in Chapter 2. The chapter began by operationalizing the constructs outlined in Chapter 2. A general discussion of the targeted sample followed. Next, the methodology used to conduct the two pilot studies and the main study was described. This section included a discussion of the refinements resulting from pilot study 1 and 2. The refinements and learnings from the pilot studies were incorporated in the main study. A description of the final enhancements, data collection, data evaluation and final sample followed. The chapter closed with a discussion of PLS-SEM and how it will be used to evaluate the outer and structural models. The discussion of PLS-SEM offers insight into the specific techniques used to validate the measures used and assess the relationships hypothesized in this study. Chapter 4 will evaluate the results of the study. It begins with an assessment of the outer model and ends with the results from hypothesis testing.
CHAPTER 4

RESULTS

Introduction

This chapter provides the results of the methods employed to test hypotheses presented in Chapter 2. However, prior to empirically evaluating the hypotheses, the outer model or measurements of the model must be evaluated for internal consistency reliability, convergent validity, and discriminant validity. Following the evaluation of the outer model, hypotheses are tested in order of the research questions presented in Chapter 1. Research questions 1 and 2 seek to identify and measure the elements of managerial processes. Given prior conceptualizations of organizational processes and dynamic capabilities (DCs) in general, the first assessment of managerial processes is to determine if they are indeed different from organizational processes. Research question 3 examines the influence of both managerial and organizational processes of DCs on different capability alignment relationships. The chapter concludes with an examination of the hypotheses, which is used in Chapter 5 to discuss findings and implications.

Measurement Model Evaluation

As indicated in Chapter 3, the first step in evaluating the suitability of the proposed research model is to assess the outer model for internal consistency reliability. The evaluation of internal consistency reliability involves two measures, Cronbach’s alpha and composite reliability. To begin with the more conservative measure of internal consistency reliability, Cronbach’s alpha scores were calculated. Given the adaptation of the different scales used and
a new sample population, exploratory factor analysis was used to assess the indicators for each construct. In what follows, each construct will be evaluated using Cronbach’s Alpha and composite reliability (CR). A tabular summary of the two measures of internal consistency reliability will follow for each construct.

**Internal Consistency Reliability of the Organizational Processes of DCs**

The factor analysis for the organizational processes of dynamic capabilities yielded a three-factor solution, representing *sensing* (DCOPSP#), *seizing* (DCOPSZ#), and *reconfiguring* (DCOPRP#). The three dimensions matched previous theoretical and empirical conceptualizations of the organization processes of DCs (e.g. see Teece, 2007; Lichtenthaler and Mueller, 2012). All 11 items were retained for inclusion of the Cronbach’s alpha calculation, as they each had a loading greater than 0.50. The loadings ranged from 0.684 to 0.868. Given this, the Cronbach’s alpha for the organizational processes of DCs was 0.91, which exceeds the threshold of 0.70.

CR assesses the contribution of each indicator to the latent construct. For organizational processes of DCs, 11 items were used to assess CR. Two of the items for sensing, Sensing 1 and Sensing 2 each had individual reliabilities of 0.608 and 0.617 respectively. The ideal value for individual reliabilities is 0.70 and higher to ensure that the latent construct explains 50 percent or more of the variance present in the indicator. Given this, Sensing 1 and Sensing 2 are targets for possible elimination. However, since the composite reliability for organizational processes was 0.92, which exceeds the desired threshold of 0.80, the items were retained for theoretical reasons. Table 13 combines the results of the two measures of internal
consistency for the organizational processes of DCs. As a result of the two tests, the internal consistency reliability of the measurement items representing the organizational processes of DCs is suitable for inclusion in this study.

Table 13

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>EFA Loadings</th>
<th>Cronbach’s Alpha</th>
<th>Outer Loadings</th>
<th>Composite Reliability (CR)</th>
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Internal Consistency Reliability of the Managerial Processes of DCs

Due to the development of the managerial processes of DCs in this study, a slightly different approach was taken to obtain the initial EFA structure. First, the development of each factor, strategic rationale, systems integration, and governance structure was done separately to identify the underlying dimensions for each factor. Given this, a factor analysis was conducted on each of the three factors to identify the underlying dimension structure theorized in Chapter 2. As a result, the internal consistency reliability for each latent variable was assessed using Cronbach’s alpha and CR.
In Chapter 2, two underlying dimensions were theorized for strategic rationale (items denoted by DCMPSR_#). Principles and goals were the sub-dimensions described to reflect strategic rationale. Given this, six items were used, which yielded a two-factor structure for strategic rationale that had loadings ranging from 0.539 to 0.933. All six items were retained because they exceeded the establish cutoff of 0.50. The resulting Cronbach’s Alpha was 0.83.

The six items extracted from the factor analysis were used to assess CR. MPSR_1 had an individual reliability of 0.393, which is below the acceptable minimum of 0.40. Therefore, it was eliminated from further inclusion in the study. The model was rerun to check the individual reliabilities for the remaining five items. Each of the remaining five items had an individual reliability >0.70 and therefore, was included in the calculation of CR. The CR for strategic rationale was 0.88, which exceeds the desired threshold of 0.80. Table 14 combines the results of the two measures of internal consistency for the managerial processes of DCs. As a result of the two tests, the internal consistency reliability of the measurement items representing strategic rationale of the managerial processes of DCs is suitable for inclusion in this study.

Four items were evaluated for systems integration (items denoted by DCMPSI_#). A single factor was expected and one emerged with loadings ranging from 0.72 to 0.82. All four items were retained because they were above the minimum threshold of 0.50. The Cronbach’s alpha for systems integration was 0.77, which is above the desired cutoff of 0.70.

The four items were retained for CR analysis. The outer loadings ranged from 0.71 to 0.84, which indicate that each item is individually reliable. The CR for systems integration was 0.85 as shown in Table 14. Since both tests of internal consistency reliability were favorable, the items used to represent systems integration are suitable for further inclusion in the study.
In Chapter 2, governance structure contained three sub-dimensions: hierarchy, contracts, and incentives (items denoted by DCMPGS_#). These sub-dimensions were represented by 10 items. The factor analysis yielded four items for hierarchy, three items for contracts, and three items for incentives. All ten item loadings were greater than 0.50 and ranged from 0.65 to 0.86. A Cronbach’s alpha was calculated for each sub-dimension and for the latent variable governance structure. Hierarchy yielded a Cronbach’s alpha of 0.83, while the Cronbach’s alpha for contracts and incentives were 0.83 and 0.89 respectively.

In the case of “hierarchy,” all three items MPGS_2, MPGS_6, and MPGS_7 all had outer loadings less than 0.70, which is a cutoff that identifies each of the items as candidates for deletion. However, upon revisiting the theory presented in Chapter 2 and the supporting materials used to develop the theory, the three items were left in the analysis. Given the theoretical support for their existence and the CR of 0.90, the items show internal consistency reliability acceptable for inclusion in the study.

The assessment of the “contracts” sub-dimension identified one item, MPGS_3 that had an outer loading of 0.53, which is below the desire threshold of 0.70. The remaining two items MPGS_4 and MPGS_5 had suitable outer loadings exceeding 0.70. In review of the Cronbach’s alpha and CR for contracts, there was no need to remove MPGS_3 from the study at this time.

The evaluation of CR for “incentives” took into consideration three items. The outer loadings for those items ranged from 0.76 to 0.85, indicating that each measure is individually reliable. The CR for incentives was 0.93. Given the Cronbach’s alpha of 0.89 and the CR of 0.93, there is internal consistency reliability for incentives.
While each sub-dimension of the managerial processes of DCs was assessed for internal consistency reliability to demonstrate the stability of the developed items, the primary latent variable of interest in the study is the composite construct. Using repeated measures to reflect the managerial processes of DCs (Hair et al., 2013), the two measures of internal consistency reliability were suitable for inclusion in the study for further analyses with a Cronbach’s alpha of 0.91 and a CR of 0.92.

Internal Consistency Reliability of Dependent Variables

The three alignment constructs developed in Chapter 2 and operationalized in Chapter 3 represent the dependent variables for this study. To assess the internal consistency reliability for each of the three constructs, two measures were employed. The process to assess reliability the two measures of Cronbach’s alpha and CR were followed much like the steps taken to assess internal consistency reliability of the items for organizational and managerial processes of DCs.

A separate factor analysis was conducted for each of the three dependent alignment constructs. The first factor analysis assessed the structure of the customer-innovation alignment construct (items denoted by CCIC_#). Initially, eight items from the second pilot were included in the analysis. Two distinct factors emerged: configuration and coordination. The resulting analysis identified three cross-loadings for customer-innovation alignment, which were CCIC_3, CCIC_4, and CCIC_5. Hair et al. (2010) suggests the examination of each cross-loading to minimize the number of cross-loadings. Cross-loadings limit the item’s ability
to reflect unique variance and hence must be reviewed. The cross-loadings were prioritized based on loading values. In the case of customer-innovation alignment, CCIC_5 was evaluated first. The review began by revisiting the wording of the statement to determine if the statement reflected the intent of the sub-dimension of the sub-dimension. The wording of the statement was cumbersome and better represented by similar statements associated with the customer-innovation construct. Therefore, it was deleted from further inclusion in the study. The factor analysis was then re-run with seven items to see how the loadings may have changed. The total variance explained was also assessed to ensure that the removal of CCIC_5 did not materially change the total variance explained by the revised factor structure. The initial total variance explained was 81 percent and with the removal of item CCIC_5, the total variance explained remained 81 percent. However, cross-loadings remained for CCIC_3 and CCIC_4. The process was repeated for each of the cross-loaded items until the cross-loadings were eliminated. In total, three items were removed. In the case of CCIC_3, the sharing of goals was deemed outside of the scope of the desired sub-dimension. CCIC_4 contained wording that was better reflected in CCIC_2 and was not necessary from a theoretical standpoint to retain. The final total variance explained was 85.6 percent with the newly configured five-item construct. The Cronbach’s alpha was 0.92. The internal consistency reliability for customer-innovation alignment can be found in Table 15.

The CR for the five-item construct of customer – innovation capability alignment was then evaluated. The outer loadings for the remaining five-items ranged from 0.86 to 0.89, which exceeds the desired value of 0.70 for CR. Given the results of the Cronbach’s alpha and CR assessments, the items used to measure and the subsequent construct of customer-
innovation alignment exhibit internal consistency reliability. Given this, the items and the construct are suitable for inclusion in the study.

Table 14

Internal Consistency Reliabilities of Managerial Processes of DCs

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Item</th>
<th>EFA Loadings</th>
<th>Cronbach’s Alpha</th>
<th>Outer Loadings</th>
<th>Composite Reliability (CR)</th>
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</thead>
<tbody>
<tr>
<td>MPs of DCs</td>
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<td>0.92</td>
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<tr>
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<td>MPSR_2</td>
<td>0.539</td>
<td>0.769</td>
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</tr>
<tr>
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<tr>
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<tr>
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<td></td>
<td>0.83</td>
<td>0.90</td>
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<td></td>
<td>MPGS_9</td>
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<td>0.767</td>
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<tr>
<td></td>
<td>MPGS_10</td>
<td>0.820</td>
<td>0.857</td>
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</tr>
</tbody>
</table>
The second factor analysis assessed the structure of the customer-operations alignment construct (items denoted by CCOC_#). As with the customer-innovation alignment construct, an initial eight items from the second pilot were included in the analysis. Two distinct factors emerged: configuration and coordination. Similar to the customer-innovation alignment loadings, the resulting analysis identified three cross-loadings for customer-operational alignment, which were CCOC_3, CCOC_4, and CCOC_5. These three items contained similar wording as three items for customer-innovation alignment and are believed to exhibit some of the same issues. Given this, the cross-loadings were prioritized based on loading values. In the case of customer-operations alignment, CCOC_5 was evaluated first. As stated in the evaluation of the cross-loadings for customer-innovation alignment, the wording of the statement was cumbersome and better represented by similar statements associated with the customer-operations alignment construct. Therefore, it was deleted from further inclusion in the study. The process was repeated for each of the cross-loaded items until the cross-loadings were eliminated. In total, three items were removed. In the case of CCOC_3, the sharing of goals was deemed outside of the scope of the desired sub-dimension. CCOC_4 contained wording that was better reflected in CCOC_2 and CCOC_6 and was not necessary from a theoretical standpoint to retain. The final total variance explained was 85.7 percent with the newly configured five-item construct. The Cronbach’s alpha was 0.92. The internal consistency reliability for customer-operations alignment can be found in Table 15.

The CR for the five-item construct of customer – operations capability alignment was then evaluated. The outer loadings for the remaining five-items ranged from 0.85 to 0.90, which exceeds the desired value of 0.70 for CR. Given the results of the Cronbach’s alpha and
CR assessments, the items used to measure and the subsequent construct of customer-operations alignment exhibit internal consistency reliability. Given this, the items and the construct are suitable for inclusion in the study.

The third factor analysis assessed the structure of the innovation-operation alignment construct (items denoted by ICOC_#). An initial eight items from the second pilot were included in the analysis. As expected, two distinct factors emerged: configuration and coordination. The factor analysis identified four cross-loadings for customer-operational alignment, which were ICOC_1, ICOC_5, ICOC_7 and ICOC_8. The cross-loadings were prioritized based on loading values. In the case of customer-operations alignment, ICOC_5 was evaluated first. Consistent with the cross-loadings for customer-innovation and customer-operations alignment, the wording of the statement was cumbersome and redundant given the presence of a more cleanly written statement found in ICOC_4, which describes a similar facet. Therefore, it was deleted from further inclusion in the study. During this process, we noted the high loadings for ICOC_3, which was not cross-loading with another item, but given the high loadings ranging from 0.88 to 0.93 could influence items with weaker significant loadings. ICOC_3 was deemed to be outside of the intended scope of the sub-dimension and was selected for elimination. Due to the high loadings for ICOC_3, there was concern that elimination could reduce the total variance explained. By removing ICOC_3, the total variance explained increased from 81.3 percent to 83.8 percent and the cross-loading for ICOC_7 was eliminated. The cross-loading for ICOC_8 remained. However, upon further inspection of the statement wording, the statement did not reflect coordination, but instead focused on working together to achieve a specific outcome. The intent of ICOC_8 was better represented by
ICOC_7, hence ICOC_8 was eliminated from further inclusion in the study. The final total variance explained was 84.9 percent with the newly configured five-item construct. The Cronbach’s alpha was 0.92. The internal consistency reliability for innovation-operations alignment can be found in Table 15.

The CR for the five-item construct was then evaluated. The outer loadings for the remaining five-items ranged from 0.85 to 0.88, which exceeds the desired value of 0.70 for CR. Given the results of the Cronbach’s alpha and CR assessments, the indicators and the subsequent construct of innovation-operations alignment exhibit internal consistency reliability. Given this, the items and the construct are suitable for inclusion in the study.

In summary, the indicators and the latent constructs of interest in this study exhibit internal consistency reliability. When appropriate, unclear and redundant indicators were removed to avoid adverse conditions for the measures’ content validity (Rossiter, 2002). All latent constructs had CR values greater than 0.85 and therefore, are suitable for inclusion in the study. The next section assesses the convergent and discriminant validity of the constructs of interest.

Convergent Validity

By establishing indicator and composite reliability, a foundation exists to determine if the measures used in the study correlates positively with other measures for the construct of interest (Hair et al., 2013). This section assesses the convergent validity of the constructs used in the study. A commonly accepted measure of convergent validity at the construct level is average variance extracted (AVE). AVE takes into account the squared loadings of each
indicator associated with the construct to estimate a grand mean. The objective of the AVE measure is to determine if at least 0.50 or more of the variance found in the indicators is explained by the construct. Therefore, constructs will exhibit convergent validity if they have AVEs greater than 0.50 (Fornell and Larcker, 1981).

The AVEs for customer-innovation capability alignment, managerial processes of DCs, and organizational processes of DCs were 0.77, 0.51, and 0.55 respectively. Each AVE exceeds

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Item</th>
<th>EFA Loadings</th>
<th>Cronbach’s Alpha</th>
<th>Outer Loadings</th>
<th>Composite Reliability (CR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer-Innovation Alignment</td>
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<td>0.861</td>
<td>0.92</td>
<td>0.94</td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>CCIC_6</td>
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<td>0.868</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>CCIC_7</td>
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<tr>
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<td>CCIC_8</td>
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<td>0.879</td>
<td>0.872</td>
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<tr>
<td></td>
<td>ICOC_7</td>
<td>0.793</td>
<td>0.888</td>
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</table>
the minimum threshold of >=0.50 necessary to establish convergent validity. However, due to low loadings, several items were eliminated from the managerial processes of DCs construct. In particular, the items representing hierarchy had low loadings, less than 0.60, and were removed from the model. Four items represented a single-dimensioned construct in systems and therefore, three of the four items were eliminated due to redundancy and poor loadings. A single item best represents system modularity, as adding the items with poor loadings did not improve the AVE or CR for the composite construct. In addition, two items were removed from strategic rationale due to poor loadings. Two indicators representing the organizational processes of DCs exhibited low outer loadings below 0.60. However, upon further evaluation, when the items were removed, both the AVE and the CR decreased. As a result, the two items remained in the study for further analysis. Table 16 offers the results of the convergent validity assessment. An expanded discussion of why the changes in indicator loadings may have occurred will follow in Chapter 5.

**Discriminant Validity**

Discriminant validity assesses the distinctness of each construct to determine that it is empirically different from other constructs (Hair et al., 2013). In other words, discriminant validity establishes that each construct captures phenomena not present in other constructs. Two measures of discriminant validity are employed. The first measure investigates the cross loadings of the indicators to ensure that the outer loadings for each are greater than the subsequent loadings on other constructs. This measure is considered a more liberal measure of discriminant validity and therefore, a second measure of discriminant validity will be used.
Table 16
Convergent Validity of Initial Independent and Dependent Variables

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Item</th>
<th>Outer Loadings</th>
<th>AVE</th>
<th>Composite Reliability (CR)</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
<tr>
<td></td>
<td>CCIC_2</td>
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<tr>
<td></td>
<td>CCIC_6</td>
<td>0.868</td>
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<td>CCIC_7</td>
<td>0.896</td>
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</tr>
<tr>
<td></td>
<td>CCIC_8</td>
<td>0.878</td>
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<td></td>
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<td>0.51</td>
<td>0.91</td>
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</table>
To employ the first measure of discriminant validity, the cross-loadings of each indicator was examined to ensure the outer loading for the indicator was greater than any other correlation with another indicator. For customer-innovation capability alignment, the range of cross-loadings across the five indicators ranged from 0.49 to 0.64, all of which were below the outer loadings ranging from 0.86 to 0.89. For managerial processes of DCs, the range of cross-loadings across the ten indicators did not exceed 0.57, which is below the lowest outer loading of 0.63 for any one item representing the managerial processes of DCs construct. In the case of the organizational processes of DCs, the range of cross-loadings across the 12 indicators did not exceed 0.57, which is below the lowest outer loading of 0.59 for the organizational processes of DCs. In summary, the criterion to satisfy the most liberal measure of discriminant validity has been met. Next, the Fornell-Larcker criterion will be used to assess discriminant validity.

To calculate the Fornell-Larcker criterion, the square-root of the AVE was taken for each construct. To demonstrate discriminant validity, the criterion value should exceed the correlation value with any other construct in the model. For instance, the customer-innovation capability alignment construct (CCIC Alignment) has a criterion value of 0.87, which exceeds the correlations with managerial processes of DCs and organizational processes of DCs respectively (see Table 18). Given the results outlined in Table 18, the criterion to demonstrate discriminant validity is satisfied.

In summary, the constructs demonstrate convergent and discriminate validity. In the two measures of validity, a liberal measure and a more conservative measure of validity was used to assess the constructs of interest. By all accounts, each measure of either convergent or discriminant validity was satisfied. Given this result, the constructs and subsequent indicators,
for Model 1, exhibit the internal consistency reliability, convergent validity, and divergent validation necessary to begin structural model evaluation.

Due to the complexity of the research model, each alignment relationship represented the dependent variable of interest. As a result, three distinct models were run to assess the direct and moderating effects. Table 17 illustrates the correlations for the three dependent variable model runs, which assessed customer-innovation capability alignment, customer-operations capability alignment, and innovation-operations capability alignment. The alignment constructs were independent of one another, which is why there are no correlations among the three alignment constructs. The other correlations in Table 18 represent the latent variable correlations from each of the models, the correlation between the managerial processes of DCs and the organizational processes of DCs did not change across the models, as the indicators remained the same. The next section discusses the results from the structural models run to test the hypotheses.

Table 17

<table>
<thead>
<tr>
<th>Construct</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CCIC Alignment</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. CCOC Alignment</td>
<td></td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. ICOC Alignment</td>
<td></td>
<td></td>
<td>0.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Managerial Processes of DCs</td>
<td>0.65</td>
<td>0.61</td>
<td>0.66</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td>5. Organizational Processes of DCs</td>
<td>0.62</td>
<td>0.62</td>
<td>0.67</td>
<td>0.62</td>
<td>0.74</td>
</tr>
</tbody>
</table>

*Note: The diagonal represents the square-root of the AVE;

Structural Model Evaluation

Assessment of Research Question 1

Following the successful evaluation of the outer model (measurement model), the
measures and constructs of interest were deemed suitable for evaluation in structural models. Given the development of new constructs in this dissertation, the empirical evaluation began with the validation of the measurement model. More specifically, what are the fundamental elements that characterize the managerial processes of DCs? Utilizing architectural theory, three elements of the managerial processes of DCs were developed. Using exploratory factor analysis (EFA) to refine and clean the indicators for each element, and confirmatory factor analysis (CFA) in PLS-SEM to test the internal consistency reliability, convergent validity, and discriminant validity of each element, the construct was assessed. Figure 12 depicts the structural model for the managerial processes of DCs construct.

To evaluate the proposed managerial processes of DCs construct, a structural model of the proposed relationships was operationalized. This conceptualization of the managerial processes of DCs was assessed to examine the relationships among the elements, sub-dimensions, and indicators. Predictive accuracy of each latent variable was assessed with $R^2$ values, and t-values were calculated for each latent variable as well as for each indicator. Henseler et al. (2009) established a rule of thumb that indicate that 0.75, 0.50, and 0.25 $R^2$ values represent substantial, moderate, and weak predictive accuracy respectively. Each of the latent variables demonstrated moderate ($>0.50$) to substantial ($>0.75$) ranging from 0.54 to 0.93, suggesting good predictive accuracy (Hair et al., 2013). All paths between latent variables and indicator variables were significant at the 0.01 level. Furthermore, the composite reliability (CR) and the average variance extracted (AVE) for each of the latent variables exceeded minimum thresholds. In total, 18 items were identified and carried forward in the analysis. A
tabular summary of these results are in Table 19. Thus, there is support, which suggests that the characterization of the managerial processes of DCs is reasonable.

Offering a reasonable characterization of the managerial processes of DCs now provides an opportunity to determine if these processes are distinctively different from organizational processes of DCs. To statistically evaluate the measures used for each of the two process types of DCs, a forced two-factor solution was entered into SPSS 21, with a Varimax rotation to evaluate factor loadings. All of the 20 items loaded above 0.50 and there were no cross-loadings. As a result, there is support of Hypothesis 1, which suggests a statistical difference between the managerial processes and organizational processes of DCs exists.

Assessment of Research Question 2

The repeated measures approach was used to develop a composite managerial processes of DCs construct. The repeated measures approach is commonly used to model higher order constructs where a latent construct is comprised of other latent variables (Becker, Klein, and Wetzel, 2012). Becker et al. (2012) suggested the same number of indicators for each latent variable to reduce the potential for bias. For instance, if a higher order construct is comprised of three latent constructs, to minimize bias, the latent constructs should have a near equal number of indicators. For the managerial processes of DCs, all 18 indicators are used in the composite construct. While each of the latent variables was significant in explaining the variance of the managerial processes of DCs, the composite construct would be used for testing moderator effects. Thus, the composite construct of managerial processes of DCs was subject
to the same internal consistency reliability, convergent validity, and discriminant validity tests (Hair et al., 2013).

Upon a visual inspection, there were nine indicators representing governance structure, four for systems integration, and five for strategic rationale. The large number of indicators for governance structure was noted, in the event of bias. In an idealized state, the number of indicators for governance structure would be four or five to minimize any potential bias.

Table 18
Assessment of the Managerial Processes of DCs Elements

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Item</th>
<th>Path Coefficients</th>
<th>R²</th>
<th>t-values</th>
<th>Composite Reliability (CR)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Rationale</td>
<td>Principles</td>
<td>0.844</td>
<td>0.713</td>
<td>36.94</td>
<td>0.88</td>
<td>0.56</td>
</tr>
<tr>
<td>MPSR_1</td>
<td>0.787</td>
<td>0.619</td>
<td>25.35</td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSR_2</td>
<td>0.707</td>
<td>0.619</td>
<td>11.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logic/Goals</td>
<td>MPSR_3</td>
<td>0.966</td>
<td>0.933</td>
<td>0.90</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>MPSR_5</td>
<td>0.777</td>
<td>0.619</td>
<td>23.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSR_6</td>
<td>0.876</td>
<td>0.619</td>
<td>52.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSR_7</td>
<td>0.861</td>
<td>0.619</td>
<td>36.96</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governance Structure</td>
<td>Hierarchy</td>
<td>0.737</td>
<td>0.54</td>
<td>20.69</td>
<td>0.85</td>
<td>0.59</td>
</tr>
<tr>
<td>MPSI_1</td>
<td>0.699</td>
<td>0.54</td>
<td>12.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSI_2</td>
<td>0.761</td>
<td>0.54</td>
<td>19.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSI_3</td>
<td>0.847</td>
<td>0.54</td>
<td>38.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSI_4</td>
<td>0.771</td>
<td>0.54</td>
<td>21.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governance Structure</td>
<td>Contracts</td>
<td>0.907</td>
<td>0.823</td>
<td>59.79</td>
<td>0.89</td>
<td>0.53</td>
</tr>
<tr>
<td>MPGS_2</td>
<td>0.787</td>
<td>0.823</td>
<td>21.80</td>
<td>0.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPGS_6</td>
<td>0.801</td>
<td>0.823</td>
<td>23.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPGS_7</td>
<td>0.906</td>
<td>0.823</td>
<td>60.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentives</td>
<td>0.889</td>
<td>0.823</td>
<td>50.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contracts</td>
<td>0.726</td>
<td>0.528</td>
<td>17.94</td>
<td>0.90</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>MPGS_3</td>
<td>0.746</td>
<td>0.528</td>
<td>16.43</td>
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<td></td>
</tr>
<tr>
<td>MPGS_4</td>
<td>0.936</td>
<td>0.528</td>
<td>107.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPGS_5</td>
<td>0.911</td>
<td>0.528</td>
<td>54.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentives</td>
<td>0.879</td>
<td>0.773</td>
<td>51.52</td>
<td>0.93</td>
<td>0.83</td>
<td></td>
</tr>
<tr>
<td>MPGS_8</td>
<td>0.897</td>
<td>0.773</td>
<td>49.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPGS_9</td>
<td>0.913</td>
<td>0.773</td>
<td>61.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPGS_10</td>
<td>0.925</td>
<td>0.773</td>
<td>83.31</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 12

Measurement Model of the Managerial Processes of DCs
The AVE for the composite construct of managerial processes of DCs was below the desired cut-off of 0.50 at 0.42. This suggests that there is more than 50 percent of the variance coming from a source other than the indicators. The next step was to evaluate each indicator to see if any were unreliable and eliminate them from the model without compromising the intended content of the statement. This process was repeated until the AVE was in an acceptable range and the original content of the construct was not compromised. The subsequent AVE was 0.51 and the CR was 0.91. However, eight items were removed from governance structure, strategic rationale, and systems integration. More specifically, two items were removed from strategic rationale due to loadings less than 0.70, three items were removed from systems integration due to loadings less than 0.60, and three items were removed from governance structure due to loadings below 0.60. In total five out of the six sub-dimensions remained. Hierarchy, under governance structure, yielded low loadings for all three items and hence the hierarchy sub-dimension was eliminated because it was not reliable in the composite construct of managerial processes of DCs. The refined model of managerial processes of DCs was then incorporated in the full research model to test for moderating effects.

In summary, research question 2 sought to identify a means to measure the managerial processes of DCs. The initial conceptualized model of managerial processes of DCs contained 18 items, representing six sub-dimensions of strategic rationale (two sub-dimensions), systems integration (one sub-dimension), and governance structure (three sub-dimensions). The refined model representing the managerial processes of DCs contained 10 items from across five different sub-dimensions. The goal of research question 2 was to offer a way to measure
the managerial processes of DCs. The results from the measurement model analysis offer two ways to measure the managerial processes of DCs: 1) through individual measures; and 2) through a composite construct. Given this, research question 2 has been addressed.

Evaluation of Research Question 3

The third research question sought to explain how managerial processes and organizational processes of DCs influence ordinary capability alignment. The first step to address this question is to test for potential direct effects of organizational processes of DCs with each of the capability alignment relationships. To test for direct effects, a latent construct for the organizational processes of DCs was created. The capability alignment constructs represented the customer-innovation capability alignment, customer-operations capability alignment, and innovation-operations alignment. Work conducted in this chapter identified these measures as suitable for hypothesis testing. Therefore, the three capability alignment constructs served as the dependent variables and the organizational processes of DCs was the independent variable. Control variables were entered for firm size, firm age, respondent experience level, and the respondent’s position level as described in Chapter 3. An assessment of Hypotheses 2, 4, and 6 concludes that organizational processes of DCs are positively and significantly related to customer-innovation capability alignment, customer-operations capability alignment, and innovation-operations capability alignment. In the analysis of Hypothesis 2, respondent position level and firm age were significant at the 0.05 and 0.10 levels respectively. All other control variables in Hypothesis 2 were insignificant. In the analysis of Hypothesis 4, respondent position level was significant at the 0.01 level, whereas firm size, firm
age, and respondent experience level were not significant at any level. For Hypothesis 6, none of the four control variables was significant. Table 19 illustrates the results of the tests for Hypotheses 2, 4, and 6.

Table 19

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>Path Coefficient</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 2</td>
<td>OPs of DCs → CCIC Alignment</td>
<td>0.582 ***</td>
<td>10.07</td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td>OPs of DCs → CCOC Alignment</td>
<td>0.557 ***</td>
<td>9.36</td>
</tr>
<tr>
<td>Hypothesis 6</td>
<td>OPs of DCs → ICOC Alignment</td>
<td>0.658 ***</td>
<td>14.26</td>
</tr>
</tbody>
</table>

Note: ***significant at 0.01

The next step to evaluate research question 3 was to test for moderating effects. The proposed moderator variable is the managerial processes of DCs. To assess the influence of managerial processes of DCs on the relationship between organizational processes of DCs and customer capability alignment, a revised structural model was created. To model the moderating effects, the moderating variable was created using the product indicator approach (Chin, 2003). The product indicator approach was chosen because the moderator variable is continuous and not categorical. To model the moderating effect, each indicator from the organizational processes of DCs is multiplied with each indicator from the managerial processes of DCs. The resulting product is an indicator for the moderating variable (Chin, 2003). To determine the significance of the moderator, the path and t-values of the newly created moderator variable was assessed. The requirements for internal consistency reliability, convergent validity, and discriminant valid hold true for the moderator variable. To reduce the complexity associated with interpreting multiple simultaneous moderator effects, each capability alignment was tested independently of one another.
Table 20
Moderator Hypotheses Analysis

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path Moderated</th>
<th>R²</th>
<th>OPs*MPs (Moderator) Path Coefficient</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 3</td>
<td>OPs of DCs → CCIC Alignment</td>
<td>50.4%</td>
<td>0.154 ns</td>
<td>0.343</td>
</tr>
<tr>
<td>Hypothesis 5</td>
<td>OPs of DCs → CCOC Alignment</td>
<td>50.9%</td>
<td>0.191 ns</td>
<td>0.475</td>
</tr>
<tr>
<td>Hypothesis 7</td>
<td>OPs of DCs → ICOC Alignment</td>
<td>55.4%</td>
<td>0.896 **</td>
<td>2.091</td>
</tr>
</tbody>
</table>

Note: ns – not significant; ** significance at 0.05

The mixed results from the testing of Hypotheses 3, 5, and 7, were not expected (See Table 20). Hypothesis 3 and 5 were insignificant, yet Hypothesis 7 was significant at the 0.05 level. The insignificant findings for Hypothesis 3 and 5 suggest that the composite managerial processes of DCs have no influence on the relationships between organizational processes of DCs and either of the respective capability alignments. However, the significant and positive findings for the moderating effect of the composite managerial processes of DCs construct on relationship offers support of Hypothesis 7, in the hypothesized direction. Given the mixed results, additional analysis was undertaken to offer insight into the results.

In review of Table 18, each element, strategic rationale, systems integration, and governance structure exhibited higher internal consistency reliability, convergent validity, and discriminant validity than did the composite construct of managerial processes of DCs. Thus, the next step was to examine the influence of each element as a moderator of the organizational processes of DCs – capability alignment construct of interest. Where appropriate, if an element contained a sub-dimension, the testing was extended to the next level. This in-depth evaluation will support the discussion in Chapter 5.
In the first model, customer-innovation capability alignment was the dependent variable and each element of managerial processes of DCs was tested independently. For instance, strategic rationale was tested as the moderator to determine if this element of managerial processes of DCs influenced the relationship between the organizational processes of DCs and customer-innovation capability alignment. In this case of capability alignment, each element of the managerial processes of DCs was insignificant. However, the contracts sub-dimension of governance was significant at the 0.10 level. Overall, this finding is consistent with the insignificant findings for the same dependent variable, when the composite managerial processes of DCs construct was used. The insignificant results imply that managerial processes of DCs have no influence on the relationship between organizational processes of DCs and customer-innovation capability alignment. As with the findings from the composite moderator analyses, the control variables firm age and position level were significant at the 0.10 and 0.05 levels respectively.

The second model used customer-operations capability alignment as the dependent variable. Each element of managerial processes of DCs was tested independently, as the moderator of the relationship between organizational processes of DCs and customer-operations capability alignment. In this instance, none of the elements or sub-dimensions were significant. These findings are consistent with those found when the composite managerial processes of DCs construct was assessed as the moderator. The insignificant results imply that managerial processes of DCs have no influence on the relationship between organizational processes of DCs and customer-operations capability alignment. However, the control variable
respondent’s position level was significant at 0.01 level, similar to the findings in the composite moderator analyses.

Figure 13

Moderator Analyses

The third model used innovation – operations capability alignment as the dependent variable. Unlike the first and second models, two of the three elements were significant at the 0.05 level. Governance structure and systems integration were significant, but strategic
rationale was not significant at any level. In general, these findings corroborate the results from the evaluation of the same relationship, which utilized the composite managerial processes of DCs as the moderator. Based on the analysis, Hypothesis 6 is supported. None of the four control variables were significant in Model 3, which is consistent with the findings from the composite moderator analyses. Table 21 provides a tabular summary of the additional analyses conducted.

Table 21
Managerial Processes of DCs Elemental Moderation Summary

<table>
<thead>
<tr>
<th>Path Moderated</th>
<th>Strategic Rationale</th>
<th>Systems Integration</th>
<th>Governance Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPs of DCs</td>
<td>CCIC Alignment</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>OPs of DCs</td>
<td>CCOC Alignment</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>OPs of DCs</td>
<td>ICOC Alignment</td>
<td>n.s.</td>
<td>**</td>
</tr>
</tbody>
</table>

Note: n.s. – not significant; * - significant at 0.10; ** - significant at 0.05.

Summary

This chapter began with a detailed discussion of the measurement model and the various analyses used to validate the measurement model. Given the development of new scales and measures unique to this study, two techniques were used to assess the internal consistency reliability, convergent validity and discriminant validity for the indicators and constructs used in this study. Once the measurement model was deemed suitable for further analysis, structural models were developed to address the research questions outlined in Chapter 1.
Research questions 1 and 2 pertain to the development of the managerial processes of DCs construct and how it could be measured. The analysis of these questions yielded an empirical conceptualization of the newly developed construct that exhibited internal consistency reliability, convergent validity, and discriminant validity. This conceptualization was then used to address research question 3. To conduct hypothesis testing, a refined composite managerial processes of DCs construct emerged that was suitable for testing direct (hypotheses 2, 4, and 6) and moderating effects (Hypotheses 3, 5, and 7). Hypotheses 2, 4, and 6 were supported, suggesting that the organizational processes of DCs positively influence each type of capability alignment (i.e., customer - innovation, customer - operations, and innovation – operations). The analysis of hypotheses 3, 5, and 7 yielded mixed results. Hypotheses 3 and 5 (i.e. the relationships between organizational processes of DCs and customer – innovation and customer – operations capability alignment) were insignificant. Yet, hypothesis 7 (the relationship between organizational processes of DCs and innovation – operations capability alignment) was significant at the 0.05 level. In Chapter 5, the results of these analyses are discussed in detail. Then, implications for researchers and managers are shared. Chapter 5 closes with a discussion of study limitations and suggestions for future research.
CHAPTER 5
DISCUSSION

Introduction

The objectives of this investigation were three-fold: 1) to characterize the elements of the managerial processes of dynamic capabilities (DCs); 2) to determine how to measure the managerial processes of DCs; and 3) to understand how the organizational and managerial processes of DCs influence ordinary capability alignments. To address these research questions, an introduction of the topic and gaps was presented, followed by a detailed literature review, which resulted in the development of theoretical models that could examine the proposed relationships. The proposed research model was refined and operationalized. Data were collected and analyzed to assess the validity of the research model and testing of the proposed influences began. In this chapter, the results outlined in Chapter 4 are discussed in detail to interpret the implications for researchers and managers. The chapter closes with a discussion of the limitations of this study and recommendations for future research are offered.

Results

Research Question 1 and 2

The first research question focused on the fundamental elements of the managerial processes of DCs. More specifically, what are these elements and what role do they play in the use or creation of DCs. In earlier works on DCs (Teece et al., 1997; Eisenhardt and Martin, 2000; and Winter 2003), researchers describe how DCs are comprised of processes or routines that enable competitive advantage. While not always explicitly stated, these works describe
two foundational elements of DCs: organizational and managerial processes. In general, a majority of the work on DCs expanded in the area of organizational processes, without much consideration or discussion of the managerial processes of DCs (see Teece, 2000 and 2007). However, as the DCs research domain grew, an increasing number of researchers (Adner and Helfat, 2003; Helfat et al., 2007; Augier and Teece, 2009; Teece, 2012; and Kor and Mesko, 2013) began to note the relevance of the managerial component of DCs. The conceptualization of the managerial component of DCs occurred in two primary ways, as capabilities (e.g., Adner and Helfat, 2003 and Kor and Mesko, 2013) and as processes (e.g., Helfat et al., 2007 and Teece, 2012). In some cases, the distinction between organizational and managerial processes was unclear (see Teece, 2007). Were the managerial processes of DCs assumed as a part of the organizational processes or were they independent and distinct? In this study, it was hypothesized that distinct differences between organizational and managerial processes exists. Using exploratory and confirmatory analyses this first hypothesis was supported.

Helfat and Adner (2003) defined dynamic managerial capabilities as the capabilities managers possess to build and change organizational resources and competencies. Kor and Mesko (2013) expand upon this development of dynamic managerial capabilities and link the three elements of dynamic managerial capabilities (managerial human capital, managerial social capital, and managerial cognition) to dominant logic. These theoretical developments inform our knowledge of the capabilities used by managers to influence organizational decision-making, but more work is needed to describe the specific processes these managers use to enable those capabilities. This study offers insight into these processes through the articulation of the managerial processes of DCs. More specifically, by outlining the processes
managers use to enable organizational processes, managerial processes of DCs provide structure necessary for the organization’s dominant logic to evolve to address opportunities and threats.

Helfat and Peteraf (2009) suggested that DCs require repeatability. Organizations use DCs to adapt ordinary capabilities based on objectives and environmental changes. To consistently drive change, this study suggests that strategic rationale is needed to consistently reinforce the organization’s strategic objectives. Systems integration provides the flexibility to adapt by emphasizing the importance of modular processes. Finally, governance structure provides the processes necessary to consistently and repeatedly use and develop capabilities that are consistent with strategic objectives. This closely aligns with the conceptualization developed by Kor and Mesko (2013), in which they illustrate how executives use the elements of dynamic managerial capabilities to contribute to the organization’s success in adapting its capabilities to achieve evolutionary fit driven by the environment. The present study parallels their logic by offering managerial processes as a means to describe how the organization adapts its processes to achieve alignment. Subsequently, the realignment of ordinary capabilities provides evolutionary fit driven by the environment.

The second research question addressed how to measure the managerial processes of DCs. Prior research of DCs illustrated what comprised DCs and not how DCs are used to orchestrate change. Pavlou and El Sawy (2011) articulated a need to understand the building blocks of DCs. They go on to describe DCs as “managerially-amenable practices that managers can act upon” (p. 260). To this end, the present study contributes to this logic by developing and testing the managerial processes of DCs. In a similar context, Helfat et al. (2007) described
the importance of how foundational elements of DCs require closer examination. A closer examination of DCs, such as the distinction between managerial and organizational processes, provides more insight into how DCs influence ordinary capabilities. Teece (2007) provides a detailed account of the “microfoundations” of DCs to help ground the field in the building blocks of DCs, yet there is no discernable discussion of how managerial processes of DCs is a core building block. Later, Teece (2012: 1398) argues the importance of “managerial function” as a requirement to orchestrate assets. This study provides a theoretically grounded and empirically tested model of those “managerial functions through the operationalization of the managerial processes of DCs. The empirical model of the managerial processes of DCs offer researchers a reliable and valid instrument to advance our understanding of how organizations use DCs. While the theoretical developments of the managerial processes of DCs are sure to continue, the developments in this investigation will offer insight that could carve new paths of empirical research needed in the field.

Research Question 3

The third research question sought to explain how the organizational and managerial processes of DCs could influence different capability alignments. Prior research established a distinction between DCs and ordinary capabilities theoretically and empirically (see Helfat and Winter, 2011; Drnevich, and Kriauciunas, 2011). Given this, the first step to address this research question was to test the direct relationship between organizational processes of DCs and the different capability alignments. Prior research had established empirical relationships between organizational processes of DCs and ordinary capabilities (see Capeda and Vera, 2007;
Protogerou et al., 2011), but not on capability alignments. To answer the research question, it was hypothesized that the organizational processes of DCs influenced each of the capability alignments (i.e., customer – innovation capability, customer – operations capability, and innovation – operations capability). To assess the influence of the organizational processes of DCs on the different capability alignments (as stated in Hypotheses 2, 4, & 6), a structural model was created with the organizational processes of DCs as an independent variable and the capability alignment constructs as dependent variables. The path coefficients found in the structural model suggest that strong positive relationships exist. Bootstrapping revealed that each of the three paths tested are highly significant (p<0.01). Thus, it was determined that the organizational processes of DCs positively influence each of the three capability alignment relationships (i.e., customer – innovation, customer – operations, and innovation – operations).

These findings empirically support the theoretical and conceptual works proposed by prior researchers (e.g., Teece, 2000 and Winter, 2000 and 2003) by way of extension, which suggests that organizational processes of DCs directly influence ordinary capabilities. Extending from capabilities to the alignment of capabilities, the results are in line with the findings from other studies which have found significant, direct relationships between organizational processes of DCs and ordinary capabilities (Capeda and Vera, 2007; Protogerou et al., 2011). Presently, no studies exist that empirically examine the alignment relationships among capabilities.

The next step in the investigation was to assess how the conceptualization of managerial processes of DCs and the organizational processes of DCs influenced different capability alignments. Examining possible interactions of the two types of DCs processes on the
capability alignments will offer insight into how they may work. To conduct a more in-depth investigation, the managerial processes of DCs construct was entered into the structural model as a moderator variable. Easterby et al. (2009) described how managerial processes help shape the output from organizational capabilities by depicting the degree in which benefits may be realized. Sirmon et al. (2011) refer to this process as asset orchestration, but also allude to how managerial processes of DCs influence the extent to which benefits are garnered. The composite managerial processes of the DCs construct was therefore, used as the moderator.

An empirical assessment of the structural model was conducted with the composite managerial processes of DCs as the moderator and the organizational processes of DCs as the independent variable. The dependent variable was one of the three capability alignments denoted from the study. To minimize the complexity associated with interpreting moderator results, each of the capability alignment constructs (i.e., customer – innovation, customer – operations, and innovation – operations) were run in separate structural models. This choice was made to maintain the power necessary to detect significance at the 0.05 level. A fully loaded model (with all constructs included) is discussed later in this chapter.

The results from this examination were mixed. Hypotheses 3 and 5 (customer-innovation capability alignment and customer-operations capability alignment) were not supported. While not expected, the insignificant findings for Hypotheses 3 and 5 invite interesting discussion. O’Leary-Kelly and Flores (2002) found mixed results for different interactions that involved customer-innovation capabilities and customer-operations capabilities. Their study investigated the moderating effects of business strategy on the capability integrations – performance relationship. While their study is not directly about DCs,
the strategies described allude to organizational processes used in the each of the respective business models reflecting strategy associated with organizational processes of DCs. The rationale for the mixed results will follow later in this chapter. However, Hypothesis 7 (innovation–operations capability alignment) was positive and significant ($p<0.05$), as hypothesized. The results from Hypothesis 7 are in line with Protogerou et al. (2011), as they found that DCs influence the rate of change in operational capabilities. Pavlou and El Sawy (2011) argued that turbulent environments moderate the relationship between DCs and operational capabilities. While their paper describes how the presence of a turbulent environment acts as a moderator, by extending this logic to the present study, a slightly different perspective could argue that it is what the managers do and how they execute in those environments that influences the relationship. These findings suggest that additional investigation is necessary to offer insight as to why this may have occurred.

Given that each element (strategic rationale, systems integration, and governance structure) exhibited internal consistency reliability, convergent validity, and discriminate validity, the next step was to evaluate the revised structural models. The revised models utilized these elements independently as possible moderators. Again, to minimize the complexity associated with interpreting moderator results, each of the capability alignment constructs (i.e., customer–innovation, customer–operations, and innovation–operations) were run in separate structural models.

The results from this examination were interesting. None of the three elements were significant for customer-innovation capability alignment and customer-operations capability alignment. However, governance structure and systems integration were positive and
significant (p<0.05) for the innovation – operations capability alignment model. These findings are consistent with the findings from the composite managerial processes of DCs moderator analysis. Given this, the results from this study offer new perspectives to consider when researching DCs.

In conclusion, the findings from this investigation contribute to the DCs literature in a number of ways. First, this study developed and tested a reliable and valid scale for the managerial processes of DCs. By testing the developed scale in a structural model researchers and practitioners will benefit from this study. Those implications are discussed later in this chapter. Second, the organizational processes of DCs positively influence the alignment of ordinary capabilities, which extends the theory of DCs by offering further explanatory power of the construct. Third, the mixed results provide new insights into how DCs influence capability alignment. Why did one of the three moderated relationships yield significant findings? To answer this question, a more detailed discussion is warranted.

This study investigated the moderating effects of the managerial processes of DCs on the relationships between the organizational processes of DCs and various capability alignments. However, is it possible for managerial processes of DCs to influence these relationships differently? In a review of the moderator analyses, the direct effects of the managerial processes of DCs were positive and significant. It was noted that the R^2 values significantly increased when the managerial processes of DCs was modeled as a direct effect. This suggests that the reconceptualized construct of DCs, using both organizational and managerial processes to describe DCs, has stronger predictive accuracy than it would if each construct was used independently. This contributes to the literature by clearly illustrating that
both organizational processes and managerial processes are needed to describe how DCs influence capability alignment.

The insignificant moderator findings for customer-innovation capability alignment and customer-operational capability alignment suggest that, in the context of this study, the managerial processes of DCs are best modeled as an independent variable when evaluating the effects on these specific capability alignments. On the one hand, these findings support the theoretical assertions made by Teece et al. (1997), Eisenhardt and Martin (2000), and Helfat et al. (2007) that there are organizational and managerial processes at work in DCs. On the other hand, the limited empirical research on DCs and ordinary capability alignment required careful attention. In particular, the empirical findings by O’Leary-Kelly and Flores (2002) offered additional insight. They found that different strategies (cost leadership, differentiation, product innovation, etc.) moderated the interactions between marketing (customer capability areas) and manufacturing (operations and innovation capability areas). They contend that no universal law exists that consistently describes how marketing and manufacturing areas integrate to achieve a fit. Herein lays a plausible explanation of the mixed results.

In the context of this study, a reasonable extension of the work by O’Leary-Kelly and Flores (2002) suggests that the managerial decisions undertaken for a particular strategy may or may not influence the integrative capacity of customer-operations alignment. Furthermore, this implies that the strength or even the presence of the managerial processes of DCs may have no influence on the organizational processes of DCs and the two capability alignment relationships (customer-innovation capability and customer-operations capability) as a moderator. In other words, if the organization is pursuing a product innovation strategy, but
the customer and innovation capabilities are not aligned, no level of managerial processes of
DCs will influence the organizational processes of DCs relationship with customer-innovation
capability alignment. However, given the complexity of this level of modeling more work is
needed to offer further explanation.

The significant finding from the moderated relationship between organizational
processes of DCs and innovation-operations alignment offers additional insight into how DCs
could influence capability alignment. In addition to confirming that both organizational
processes and managerial processes are needed to determine the effects of DCs on capability
alignment, the significant moderation finding contributes to the DCs literature by illustrating a
different way the managerial processes of DCs could influence innovation-operations capability
alignment. The findings from this investigation offer interesting insight into DCs and
organizational alignment literatures. In the next section, the contributions to research and
practice are discussed.

Implications for Researchers

This study offers insightful implications for researchers. The theory and model
developed in this investigation identified elements that conceptualized the managerial
processes of DCs. Until now, the managerial processes of DCs received little attention. Adner
and Helfat (2003) and Kor and Mesko (2013) reinvigorated the conversation about managerial
influence on DCs by discussing dynamic managerial capabilities. These theoretical
developments offered insight into why it was necessary to emphasize the role of management
in the creation and use of DCs. However, to this point, the field has generally lacked a means to measure the influence of managerial capabilities or processes.

 Architectural theory was used to develop and support three elements of the managerial processes of DCs. For robustness, the initial theory established three dimensions for each element. Upon further refinement, strategic rationale was reduced to two dimensions and systems integration focused on modularity. The governance element contained the original three dimensions. The reconceptualized measurement model for the managerial processes of DCs is shown in Figure 12. Each latent construct contained in Figure 12 was found to be reliable and valid. In the future, researchers could utilize the model to adapt for further examination of the DCs phenomenon.

 Researchers could also benefit from the process undertaken when those elements and sub-dimensions from Figure 12 were used in the research model as predictor variables. Utilizing the repeated indicators approach (Hair et al., 2013), the elements sub-dimensions were compiled together to form the composite construct representing the managerial processes of DCs. However, to achieve acceptable thresholds for reliability and validity of the composite construct, additional items were removed. Five of the six sub-dimensions were represented in the final composite scale.

 The hierarchy sub-dimension was eliminated from the composite scale. A review of the literature was conducted to understand why this may have occurred. The intent of the three statements representing the hierarchy sub-dimension of governance structure was to understand how hierarchy influenced the managerial processes of DCs. Gavetti (2005) described how the microfoundations of capabilities required rethinking because they were
solely conceptualized from a process-based perspective. He argued that cognitive logics must be considered. In other words, there is a behavioral perspective that should be considered when examining hierarchy. In review of the items developed to represent hierarchy, the wording of the statements was unclear, making it difficult for the respondent to appropriately respond to the stimuli. The desired outcome from those statements was to provide a process-based view of informal hierarchy. The items contain both process-oriented and behavioral-based wording that could result in an unclear statement.

The removal of items from the scale produced a revised scale that yielded internal consistency reliability and both convergent and discriminant validity. Researchers could leverage the scale to assess the managerial processes associated with capabilities or specific sub-dimensions of interest. Using the scale in whole or in part offers researchers something that they do not yet have, which is a reliable and valid means to operationalize the managerial processes of DCs.

Developing this scale could assist with analyzing the complexities associated with DCs within an organization. Given the strength of each element of the managerial processes of DCs, researchers can delve deeper into how each of these elements interacts with the sensing, seizing, and reconfiguring elements from the organizational processes of DCs. Teece (2007) provides a framework of the microfoundations of DCs, which could offer rich opportunities to evaluate these interactions. While it is generally assumed that these three elements of organizational processes work in concert with one another, adding the operationalization of the managerial processes of DCs could offer differing views of how they may or may not work together. The present study evaluated the relationship in the form of a moderator. Given the
limited presence of empirical studies regarding the managerial processes of DCs, the conceptualization of it being different from sensing, seizing, and reconfiguring is new. Such a conceptualization provides researchers with insight into viewing mediated relationships or moderated-mediated relationships, which could add to the empirical base of literature in the DCs research.

The findings from this study illustrate that the organizational processes of DCs positively influence the alignment between ordinary capabilities. In each instance, the direct effects were positive and highly significant. When the direct effects of the managerial processes of DCs were observed, there was a positive and significant increase in $R^2$ of the alignment construct. This supports the general theoretical developments outlined by Eisenhardt and Martin (2000) and Helfat et al., (2007) that describe how organizational and managerial processes of DCs work together. This invites researchers to consider different ways of conceptualizing the impact DCs have on capabilities and the performance output from those capabilities.

While only one of the three moderator hypotheses was significant (ICOC Alignment), this exploratory study has found two ways in which a reconceptualization of the DCs construct could offer additional explanatory power of capability alignment. First, this study falls in the line with prior research, which indicates that the use of DCs is context specific (Danneels, 2010). In this study, the mixed results from the moderator hypotheses analyses confirm that context matters. Hypothesis 7 was supported suggesting that when considering innovation-operations capability alignment, governance structure and systems integration are important. However, those same elements were insignificant in this study for customer – innovation alignment and customer – operations alignment. To offer additional insight, Danneels (2010) utilized a case
study methodology to evaluate the dynamic capabilities of Smith-Corona. He concluded that by the time Smith-Corona realized what was happening in the typewriter marketplace, their ability to respond quickly with new product offerings was neutralized by their inability to understand what new products the market desired. In this case, the company possessed DCs (innovation – operations capability alignment), but lacked DCs in other areas (customer – innovation capability alignment). Danneels concludes that the error in managing its resources and capabilities led to the demise and closure of Smith-Corona. In the context of the present study, the operationalization of managerial processes could offer additional insight into why this occurred. By offering an organizational and managerial depiction of DCs processes, a researcher could examine this issue through multiple lenses. This study contributes a theoretical and empirically supported model of using both organizational and managerial processes. This contribution offers researchers a means to further explain how DCs influence capabilities.

Second, the operationalization of the alignment constructs will contribute to the field of organizational theory by extending the concept of organizational fit with the environment to a step back inside of the organization by using alignment theory to suggest how the firm’s alignment of internal capabilities may influence change. Prior studies focused on external fit (Miller, 1992). Protogerou et al. (2011) provided a path illustrating how DCs influence ordinary capabilities that in turn, influence performance. This study offers parallel insight by suggesting that the direct relationship between organizational processes of DCs and the capability alignment constructs could offer additional insight about performance.
Overall, researchers can utilize the theory and measures developed in this study to offer new perspectives in DCs research. The reconceptualization of the DCs construct offers a rich, updated construct that offers additional predictive power when compared with the traditional operationalization of DCs. The alignment constructs offer insight into the importance of internal configurations and coordination between different capability areas. The work from this study can be used for further theoretical developments and offer ways to examine some of the untested theories associated with DCs.

**Implications for Managers**

From a managerial standpoint, the developments here offer three elements that managers could consider when assessing their organization’s ability to adapt to change. The study reinforces the need to plan, execute, and control, which are all functions of management that are often overlooked. Managers can use the elements from the reconceptualization to begin to understand how complex these capabilities are and how they may be used to benefit the organization. These complexities are difficult to manage if seen, and unsurmountable if undetected.

Managers could use the scale to assess managerial processes. The scale could be used to identify an inflection point that may help managers determine if more or less managerial process intervention is needed, and if more is needed, where resources may be put to their best use. Leonard-Barton (1992) highlighted how core competencies could become core rigidities if the organization does not actively manage its resources and capabilities. This study offers insight regarding the divide between a competence and a rigidity, to minimize this
likelihood. Given the strength of each individual element, managers can begin to assess their teams in these areas to fine-tune processes associated with each element.

From a managerial perspective, the testing of these constructs provides a partial picture of how DCs may influence alignment between different capability areas. Managers within the ordinary capability areas can see the importance of coordinating with managers from other capability areas to address organizational objectives. They can also determine the need to balance the application of managerial processes in the use of DCs. Managers can better visualize how possession of organizational processes of DCs could enhance or hamper the use of the managerial processes of DCs. The study parallels assertions that DCs are context specific (Danneels, 2010), which is relevant to managers because it could offer insight into why the use of different types of DCs and alignments may be appropriate. The knowledge gained here allows the manager to more accurately allocate resources.

Limitations

As noted, this study makes several contributions to DCs research, yet, limitations of the study exist and must be placed into context when considering the interpretations of the findings. First, given the exploratory nature of this study and the limit of empirical assessments of the DCs phenomenon, the generalizability of the results should be considered. The context of this study used participants across different industries and different position levels within each respective organization. Future researchers are encouraged to replicate the current study to determine if the results are similar (i.e. say for a specific industry in lieu of multiple industries).
To collect data, a survey methodology was employed via a third party. There are two points of consideration regarding limitations in utilizing such a data collection technique. First, participants provided responses to all questions/statements in a single setting, which could introduce response bias. Future researchers are encouraged to divide the survey into two sessions where statements and questions regarding the dependent and independent variables are assessed at different times to minimize response bias (see Dumas et al., 2013).

Second, while the researcher outlined controls for the third party administrator to administer during the deployment of the survey, control of the release and capture of data was beyond the researchers immediate control domain. However, the response rates obtained were in line with online surveys (Cook et al., 2000) and similar studies utilizing third party providers for data collection and administration (Long et al., 2011; Dumas et al., 2013). Future researchers, should consider administering the survey to the participants to maintain as much control as possible over survey deployment and data collection. Data collection was monitored in real time to identify quality issues, but control issues outside of the survey data entry process could exist. For instance, at one point 114 additional responses were included in the online data set due to a programming error that did not pertain to the survey. The programming error allowed the survey to remain open beyond the initial close. In addition, these 114 responses did not meet the prescreening criteria. Therefore, the invalid responses were discarded and not used in this study. If the researcher had complete control over the administration process, this error could have been avoided.

Lastly, while the immediate scope of this research was DCs and how they influence the alignment of ordinary capabilities, it is possible that other variables and constructs could
influence the findings from this model. For example, Kor and Mesko (2013) describe the role of
dynamic managerial capabilities, which is shaped by the dominant logic of the organization.
Teece (2012) describe how the entrepreneurial orientation of senior managers may influence
the development and use of DCs. Thus, future researchers should be mindful in reasonable
extensions of the proposed model to incorporate these or other useful constructs into future
projects.

Future Research

The findings from this investigation suggest that the field of DCs continues to be a rich
source of future research for scholars to examine. The complexity of explaining and
understanding organizational change will require scholars to consider and use complex
theories, such as DCs, to provide insight. This investigation contributes to the DCs literature in
two ways. First, the developments in this study establish organizational and managerial
processes as mutually exclusive elements of the DCs construct. This will allow researchers to
analyze previously unclear areas within the DCs literature, such as DCs implementation.
Second, the findings from this investigation offer researchers new ways to assess organizational
change through DCs and capability alignment. By offering new ways to examine organizational
change via a reconceptualized DCs construct, DCs research opportunities are many.

This study confirmed that the organizational processes of DCs are positively related to
the alignment relationships of customer-innovations capabilities, customer-operations
capabilities, and innovation-operations capabilities. Future research should consider how these
findings could offer explanations about the fit between various capability areas within an
organization. It is generally accepted that DCs are context specific. Given these findings, researchers are encouraged to further explore under what context these relationships no longer hold and why this is the case.

This investigation offered a reconceptualized DCs construct that included organizational and managerial processes. Until the present study, few studies offered insight into the different elements of DCs. While not a direct observation of this study, there was, a sizable increase in predictive accuracy of the alignment constructs when the managerial processes of DCs were entered into the model. Future research efforts should examine other possible relationships among the organizational and managerial processes of DCs and the different capability alignments. For instance, examining managerial processes of DCs as a potential antecedent to the organizational processes of DCs or as a mediator holds promise.

Research question 2 sought ways to measure the managerial processes of DCs. The findings from the measurement model evaluation offer future researchers different dimensions and scales to address other questions surrounding the DCs phenomenon. The reconceptualization could provide future researchers with insight into the managerial processes of DCs, which was previously underrepresented in the literature. This invites scholars to raise a new line of inquiry that seeks to understand the role of managers as it relates to DCs.

Research question 3 sought to understand how the reconceptualized construct of DCs influenced ordinary capability alignment. More specifically, this study found that the managerial processes of DCs moderates the relationship between organizational processes of DCs and innovations-operations capability alignment. Yet, there was no support for the managerial processes of DCs as a moderator of either the organizational processes of DCs and
customer-innovations capability alignment relationship or the organizational processes of DCs and customer-operations capability alignment. Future researchers are encouraged to explore these findings further. For instance, do the findings stem from an artifact of the data (because of the participant pool or sample size)? Alternatively, does the relationship actually exist? Upon running the full model (inclusive of all three types of capability alignment and all three moderators), it is difficult to say that the findings are from the former. In the more complex, full model, the moderation effect of the organizational processes of DCs and innovation – operations capability alignment relationship was still significant. Given the presence of the different variables in the model, this is a strong indication that the moderated relationship is robust. However, given the large number of indicators used in the full model to represent the moderating effects, one should interpret the results of the full model carefully, as sufficient power to detect significance at the 0.05 level is of concern.

As stated in prior research (Danneels, 2010) and confirmed in this study DCs are context specific. Future researchers should embrace this notion and use the findings from this study to identify where the context may change the insignificant models to significant ones. Likewise, when does the significant model become insignificant? Future studies should take care in applying the findings from any study of DCs, because the context does matter. This investigation confirms that notion, but also provides researchers with additional insight as to when context matters most.
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